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ABSTRACT

This document reviews higher education and research in Finland. Chapter 1, the administration of higher education and research, reviews the Parliament, the President of the Republic, the Cabinet, and the Ministry of Education. Subsequent chapters cover institutions of higher learning, the overall situation in higher education in quantitative terms, the administration of higher education, university degrees, plans for the development of higher education, the administration and organization of research activities, research resources, training of researchers, academic societies and publications, special features, and plans for the development of research. (MJM)

Higher Education and Research in FINLAND

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I ADMINISTRATION OF HIGHER EDUCATION AND RESEARCH

1. PARLIAMENT

Parliament considers the major issues of educational and research policy and may influence the course of these policies in several ways. Each year Parliament must approve the annual budget presented by the Government and any additional Appropriation Bills. In addition Parliament considers specific bills on scientific research, State research institutes and institutions of higher learning.

By virtue of its legislative and budgetary power, Parliament may deal with issues of scientific research and higher education in great detail. Members of Parliament may submit bills on these matters. In addition when Parliament considers a Government bill or budget proposal, it can amend it or express certain recommendations on how it should be implemented. During a specific Question Time, Members of Parliament may pose written or oral questions which members of the Cabinet must answer within a certain period. The Minister of Education treats questions relating to higher education. Matters concerning science and higher education policy are considered by the Cultural Committee of Parliament, and those concerning appropriations by the Education Subcommittee of the Public Finance Committee. The organization of the structures of higher education is illustrated by a chart on p. 72.

2. THE PRESIDENT OF THE REPUBLIC AND THE CABINET

Supreme executive power in Finland is vested in the President of the Republic and the Government, which together make up the

Cabinet. The President makes his decisions in Cabinet meetings on the basis of proposals from the Cabinet. This is how the decrees on research and research institutes are issued.

The statutes for the State universities are given by Presidential decree, while those for the private universities are confirmed by the Cabinet. The President submits bills and budget proposals to Parliament and also appoints the professors in the State universities and the chairman of the National Council for Higher Education.

The Cabinet deals with matters to be submitted to the President. It also appoints committees and some of the members of the Science Policy Council as well as all the members of the National Council for Higher Education.

The Cabinet influences research primarily through the allocation of resources. The Cabinet makes decisions on such matters as the disposal of the research funds of the Academy of Finland and the distribution of posts for researchers and research assistants among the research councils. The members of the research councils are appointed by the Cabinet and the chairman by the President of the Republic. Ministers dealing with research matters serve as members of the Science Policy Council.

3. THE MINISTRY OF EDUCATION

In Finland there is no specific board for institutions of higher learning, but all universities fall under the direct supervision of the Ministry of Education.

The Minister or Ministers of Education are assisted by the Head of Government Office who is the highest permanent official in the Ministry. The Head of Government Office acts i.a. as a referendary in matters related to research and higher education. He deals e.g. with such matters as the appointment of university professors.

The Ministry of Education is divided into four departments: the General Department, the Department for International Relations, the School Department and the Department for Higher Education and Research. This last department has four divisions:

the Section for Higher Education, the Section for Scientific Affairs, the Section for the Planning of Higher Education and Research, and the Construction Section.

It is the task of the Ministry of Education to take care of the overall development of higher education. The Ministry of Education prepares budget proposals, proposals for laws and other matters connected with higher education which are to be considered by the President or the Cabinet. Furthermore, the routine administration of the institutions of higher learning belongs to the Ministry of Education in cases where it has not been delegated to the institutions themselves.

Permanent bodies of experts and temporary committees have been appointed to assist the officials of the Ministry in planning matters. In issues related to the development of the system of education, the Ministry of Education is assisted by the National Council for Higher Education. For higher education in technology and commerce, a special Council for Higher Education in Technology and Commerce has been appointed.

Responsibility for basic research falls primarily on the Ministry of Education, while applied research and development fall under the aegis of several ministries. The share of the various ministries in research administration is discussed in more detail on page 64. The highest body for the co-ordination of scientific research, the Science Policy Council, has its Secretariat in the Ministry of Education.

1. GENERAL

The rise and development of the Finnish system of higher education is closely connected with the cultural history of Europe. In the Middle Ages Finnish scholars were generally educated in the large universities of the European continent, above all in Paris, Bologna, Leipzig and later Greifswald and Rostock. The first university in Finland, the Academy of Turku, was established in 1640. It was granted the same privileges and independence as the University of Uppsala which, since 1476, had statutes similar to those of the universities of Paris and Bologna. Thus the Academy of Turku, which in 1848 became the University of Helsinki, springs from the oldest universities in Europe. The French Ecole Polytéchnique served as a model for the Helsinki University of Technology which was established at the end of the 1890's.

The universities and other institutions of higher learning in Finland, which were founded before the second world war, came into being mainly as a result of private initiative. Since the war the Government has increasingly taken on the task of guiding the development of higher education.

Overall planning of the system of higher education began in Finland, as in the other Nordic countries, relatively early, i.e. in the 1940's and 1950's. Long-range planning, however, has proceeded rather slowly. The main difference between the system of higher education in Finland and that in most other European countries is that in Finland a relatively high percentage of those of university age are enrolled in universities. Thus the differences in educational status between various social groups have become less pronounced.

In the 1950's and 1960's the planning of higher education in

Finland passed through four stages. In the first stage, higher education facilities were to be increased in order to provide secondary school leavers with increased opportunities for continuing their studies. As a result, enrolment increased, particularly in those university faculties which could be expanded or established relatively cheaply.

The second stage in planning higher education was determined by regional development policy. New universities were to be established in different parts of the country in order to reduce the regional differences in education. Formerly about 80 per cent of all university students studied in Helsinki. Outside Helsinki there were only two, relatively small universities, both in Turku. In the 1950's a number of new faculties were created in the University of Turku. In addition, new universities were founded in Oulu, Tampere and Jyväskylä. Moreover, smaller institutions of higher learning have been or will be established in Eastern Finland. All these measures should be seen as part of the general social policy pursued by the Government.

The third stage in the planning of higher education began about seven years ago. A Working Group appointed by the President prepared a preliminary overall plan for the system of higher education on the basis of forecasts on the demand for labour in various fields and the number of secondary school leavers and on the basis of information from other countries. Subsequently Parliament passed an act on the development of the system of higher education in 1967–1981.

Once the framework for the quantitative planning of the system of higher education had been created, attention was focused on the content of higher education. Keen debate took place on the role of the university and its development. While it was generally agreed that it is not now possible to draw as sharp a line between secondary and tertiary education as is once was, there is no full agreement on how to integrate vocational goals with tertiary education. In the debate on the tasks of the universities, it has been stressed that attention should be paid to objectives of a more general nature and to inter-disciplinary problems as well as

to vocational and scientific education on the highest levels. It has been emphasized that the universities should instil a sense of responsibility for the application of the results of research to the development of society. In this light the universities should be of great importance as a force for the continuous regeneration of society. In the reform of university examinations, account will have to be taken of these objectives.

The legal framework for Finnish universities makes them administratively rather independent. The right of self-government of the University of Helsinki is written into the Finnish Constitution. The conditions for granting government subsidies to private universities are laid down by legislation. Government support obliges these universities to provide instruction and examinations at the same level as in State universities. As the proportion of government support in the budget of the private universities is high (75–100 per cent of total expenditure), they are subject to almost all the rules that govern State universities. Since the activities and the development of the universities are closely tied to their budgets, which are fixed within the national framework for higher education, the independent activities of the universities are confined to those which they can finance with their own funds or with funds not specifically allocated in the State budget.

Current criticism of a technological culture and economic systems is reflected in Finnish university circles. It is strongly emphasized that the establishment itself has not changed much, and the universities fail to meet some of their tasks. The demand for a more democratic university has been put forward with vigour. So far, the debate has not, in this respect, led to any major tangible results.

2. INSTITUTIONS OF HIGHER LEARNING

In Finland the general term 'institution of higher learning' is applied to institutions which provide higher scientific or vocational education and carry out research, and where it is possible to earn a doctorate.

At present Finland has 17 institutions of higher learning. There are eight universities (the universities of Helsinki, Jyväskylä, Turku, Oulu and Tampere, and Åbo Academy; those of Joensuu and Kuopio have been recently established), three universities of technology (those of Helsinki, Tampere and Lappeenranta), five schools of economics (the Helsinki School of Economics, the Swedish School of Economics in Helsinki, the Swedish School of Economics of Åbo Academy, the Turku School of Economics and the Vaasa School of Economics) and one College of Veterinary Medicine.

The universities on Helsinki, Jyväskylä, Oulu, Joensuu and Kuopio, the universities of technology and the College of Veterinary Medicine are state institutions. Åbo Academy, the universities of Turku and Tampere and the schools of economics are private. Most expenses of the private institutions are met by government subsidies.

In addition to the full universities and the other institutions of higher learning, Finland has several educational institutions of university level. Many of these are private institutions receiving government subsidies (see p. 19).

2.1 Universities

The oldest and largest university in Finland is the University of Helsinki, originally the Academy of Turku, which was founded in 1640. The University of Helsinki has six faculties: theology, law, medicine, agriculture and forestry, social sciences, and philosophy. The faculty of philosophy consists of two independent subunits, humanities and science. (A list of the disciplines in which instruction is given at universities in Finland is to be found in the Appendix.)

Åbo Academy (instruction in Swedish) was founded in Turku (in Swedish, Åbo) in 1917 and opened its doors in 1919. Although Åbo Academy is small in terms of the number of students, its five faculties · the humanities, science, chemical techno-

logy, social sciences and theology – provide education over a wide range.

The University of Turku was founded with considerable private sponsorship in 1920 and opened two years later. The University of Turku is today the second largest university in Finland in terms of the number of students. It has a faculty of the humanities and a faculty of mathematics and science, both of which were formed in 1922, and a faculty of medicine, dating from 1943. The faculty of law was established in 1961 and the faculty of the social sciences in 1967.

The Folk Academy, established in 1925, became the College of Social Sciences in 1931. Since that time it has been possible to take academic degrees there. In 1960 the College moved from Helsinki to Tampere. In 1966 its name was changed to the University of Tampere. This university has today a faculty of social sciences, a faculty of the humanities and a faculty of economics and administration. There are also three vocational sections in the university: the Section for Social Studies, the Section for Public Administration and the Social Work Section.

The College of Education of Jyväskylä was founded in 1934; at that time it was decided to gradually phase out the activities of the Jyväskylä Seminar which trained primary school teachers. The College became the University of Jyväskylä in 1966. It has four faculties: education and social sciences, health and physical education, the humanities and science.

The northernmost university in Finland, the University of Oulu, was founded in 1959. At present it has faculties of the humanities, science, technology and medicine.

The University of Joensuu was established in 1966 and opened in 1969. Instruction is given in the humanities and science, and it is primarily intended for the training of teachers.

The University of Kuopio was established in 1966 and started training physicians in the autumn of 1972. Later, instruction will be given in dentistry and science. Supplementary courses in social sciences will also be provided.

2.2. Universities of Technology

Finland has three Universities of Technology; in addition to these, there is a faculty of technology in two universities.

Helsinki University of Technology developed from the Technical School of Helsinki, established in 1848. It became Helsinki University of Technology in 1908. It has nine departments: technical physics, civil engineering, mechanical engineering, electrical engineering, chemistry, mining and metallurgy, surveying, architecture and forest products.

Tampere University of Technology was established in 1965 as a branch of the Helsinki University of Technology. Tampere Institute of Technology obtained the status of an independent university on 1st August, 1972. It has four departments: mechanical engineering, civil engineering, electrical engineering and architecture.

Lappeenranta University of Technology started operations in 1969. It has a department of mechanical engineering, where great emphasis is given to instruction in economic subjects. According to current plans, a department of chemistry will be formed in 1976.

In addition, Abo Academy has a faculty of chemical engineering, and the University of Oulu has a faculty of technology with six departments: architecture, civil engineering, technical physics, chemical engineering, mechanical engineering, and electrical engineering.

2.3. Schools of Economics

The oldest and largest school of economics, the Helsinki School of Economics, dates from 1911. The first professorship was established in 1920.

The Swedish School of Economics, also in Helsinki, started as

an independent institute in 1909, took its present name in 1927, and established its first professorship in 1934.

The Swedish School of Economics in Turku, which co-operates closely with Åbo Academy, was founded in 1927.

The Turku School of Economics was established in 1949, and the Vaasa School of Economics in 1968.

The schools of economics are not divided into faculties or departments.

The lower diplomas awarded by schools of economics are the diplomas of economics, of correspondence, and the secretarial diploma. It is also possible, as in the universities, to earn a master's degree as well as a licence and a doctorate in economic science.

2.4. Other Institutions of Higher Learning

The College of Veterinary Medicine was founded in 1945 and opened in Helsinki in the autumn of 1946. In the early 1960's students attending the College had to take a two-year course in medical subjects at the Stockholm or Oslo College of Veterinary Medicine. Now new buildings have been completed, and all work for the degree in veterinary medicine can be done in Finland.

The training of teachers in Finland takes place at the Universities of Jyväskylä, Oulu and Joensuu. In addition to these, there are two temporary Teacher Training Colleges and some other institutions that give teacher training. The Teacher Training Act of 1971 provides that all training for senior secondary school and comprehensive school teachers will be carried out in university level institutes by 1974. In addition to the three universities mentioned above, teacher training will be given by the universities of Helsinki, Turku and Tampere and by Abo Academy.

The Sibelius Academy, which is situated in Helsinki, is a private institution of higher learning, which provides education in musical composition and performance on the highest level. It also trains music teachers and other persons working in the field of music. The Sibelius Academy developed from the Musical College of

Helsinki, established in 1882; over the course of time it has gradually gained the status of a university. Today, the Sibelius Academy has a General Department, a Department of Religious Music, a Department of Military Music and a Department for the Training of Music Teachers. The General Department is divided into the following lines of study: musical theory and composition, general solo performance, opera, and choir and orchestra direction.

The university students enjoy a three month summer vacation, or more. For those who want to pursue their studies during the vacation there are summer schools in university towns and elsewhere. In 1972 a total of 21 summer schools offered courses in various subjects, mainly in social science and humanities. The summer schools are run by municipalities, and they receive government subsidies. Further vocational training, for teachers in particular, is traditionally part of their programme. University teachers stand generally for the instruction in the summer schools.

Finland has four language institutes, which train translators and interpreters. The language institutes are situated in Kouvola, Savonlinna, Tampere and Turku.

Finland has a number of other institutions of higher learning. Of these, mention may be made of the Military Academy, the Helsinki Training College for Teachers of Home Economics, the Helsinki Secretarial College, the Helsinki Training College for Handicraft Teachers, the Swedish College of Social and Municipal Studies in Helsinki and the Institute for Education in Pictorial Art and Industrial Design.

3. THE OVERALL SITUATION IN HIGHER EDUCATION IN QUANTITATIVE TERMS

Enrolment in the institutions of higher learning increased slowly during the first half of the 1900's. The total number of students in the 1930's ranged between 8,000 and 9,000. A feature now typical of our system of higher education, a limitation on

the number of entrants, was first applied in the 1930's and became grade[illegible]more common. In the 1960's it became necessary to restric[illegible] number of students in almost all fields of study.

The [illegible]mber of students in the 1940's and 1950's grew at a rate of 4,000 to 5,000 a decade, but in the vigorous expansio[illegible] the 1960's, an increase of roughly the same amount took place each year. During the last decade (1960's), the number of students in institutions of higher learning grew from 20,000 to 55,000. With the rise in the number of students, the number of teachers increased greatly. The following table shows the number of students and teachers in the institutions of higher learning in Finland from 1860 to 1970:

Year	Students	Professors and assistant professors	Other teachers
1860	400	30	10
1880	1,050	40	15
1900	2,300	67	19
1920	3,600	138	103
1930	7,100	219	227
1940	9,200	252	346
1945	13,600	290	490
1950	14,400	341	645
1955	16,800	379	961
1960	23,600	480	1,202
1965	41,700	679	1,500
1970	57,100	1,000	2,400
1972	61,000	1,150	4,000

There are now (1973) about 61,000 students in the institutions of higher learning; about half of these are women.

The annual increase in enrolment in the last few years has been between 9,000 and 10,000, but it will grow to between 12,000

and 13,000 in the next few years. The distribution of students by university and by field of study is given in the table on page 23. The map on page 25 shows the university towns in Finland and the number of students in each town.

The number of teachers in the institutions of higher learning was last year about 4,000, and there was one teacher for every 15 or 16 students. Auxiliary staff (for teaching and research, administration, library work, etc.) amounts to about 2,400. Moreover, institutions of higher learning have temporary personnel and staff recruited on contract basis.

The total number of degrees taken annually at the institutions of higher learning ranges between 7,000 and 8,000.

Government investment in higher education has increased rapidly during the last five years. The annual growth, calculated at fixed prices, has been about 12–13 per cent. In 1972 the government spent 350 million marks on higher education. This sum is 16 per cent of the total expenditure on education and culture. The institutions of higher learning receive funds from other sources, but the government is the largest single source of revenue. The eight private universities receive government subsidies between 75 and 100 per cent of their total expenditure, the percentage depending on their field of study. The table on page 24 shows the number of students, teachers, degrees taken and government expenditure on higher education.

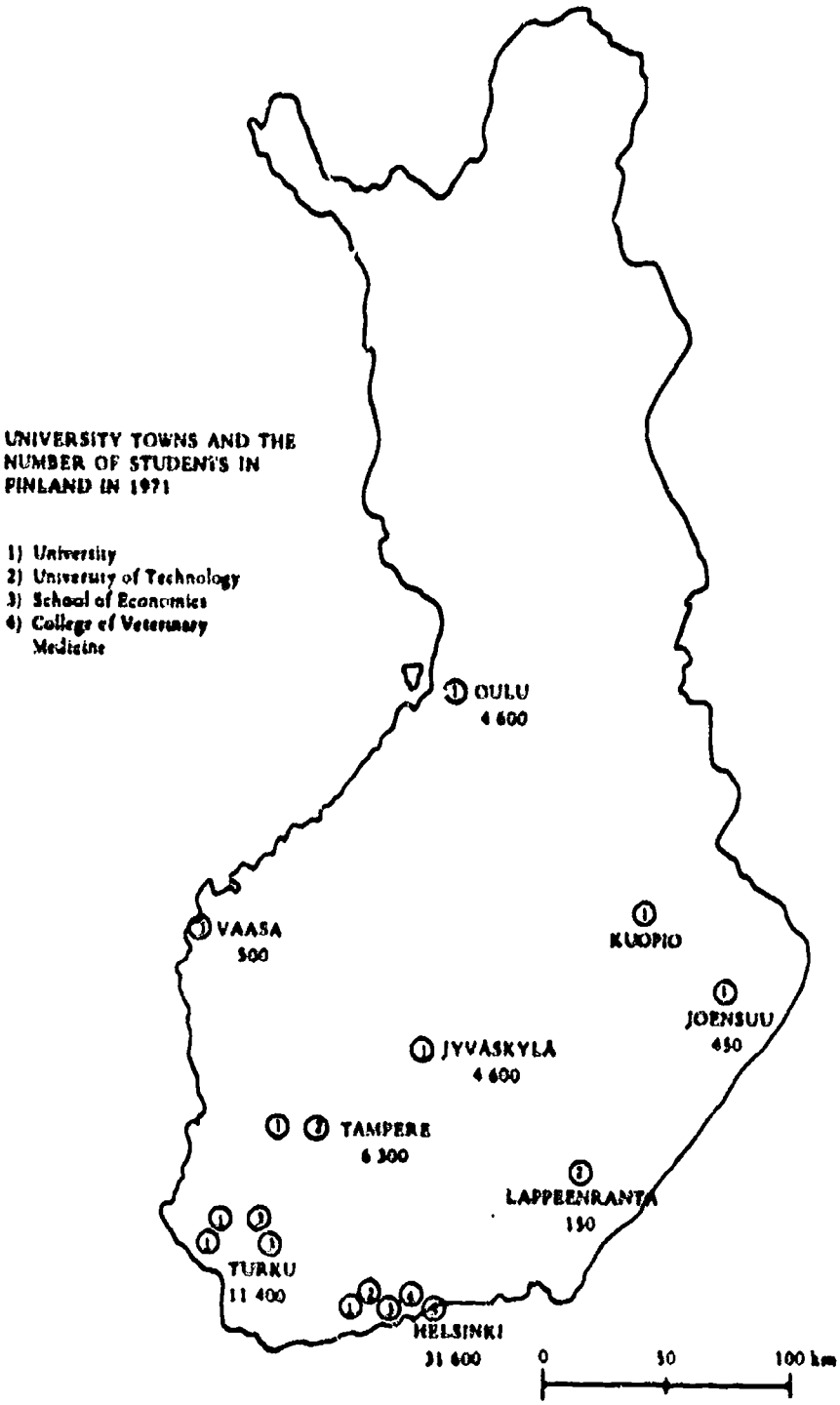
Table 1. Number of students in the autumn of 1971 by university and field of study.

University	Humanities	Mathematics & Science	Social Sciences	Economics	Technology	Medicine	Law	Agriculture & Forestry	Theology	Physical Education	Total	Women
University of Helsinki	6 700	5 800	3 000		–	1 540	2 210	1 330	1 100	190	21 940	11 430
University of Jyväskylä	1 690	1 000	1 530		–		–	–	–	360	4 580	3 670
University of Oulu	1 360	1 400			1 300	490	–	–	–	–	4 590	1 960
University of Joensuu	360	90							–	–	450	220
University of Turku	2 670	1 910	990		–	1 100	610	–	–	–	7 280	3 920
Åbo Academy	970	840	390		320	–	–	–	150		2 670	1 200
University of Tampere	1 790		3 430	350		–		–	–	–	5 570	3 230
College of Veterinary Medicine, Helsinki					–	180	–	–	–	–	180	60
Helsinki University of Technology					4 880		–	–	–	–	4 880	450
Tampere University of Technology				–	720	–	–	–	–	–	720	40
Lappeenranta University of Technology			–		130	–	–	–	–	–	130	10
Helsinki School of Economics				3 180		–	–	–	–	–	3 180	1 520
Swedish School of Economics, Helsinki				1 450		–	–	–	–	–	1 450	620
Turku School of Economics				1 010		–	–	–	–	–	1 010	390
Swedish School of Economics of Åbo Academy				480	–	–		–	–	–	480	200
Vaasa School of Economics				530			–	–	–	–	530	340
Total	15 610	11 080	9 340	7 900	7 350	3 310	2 820	1 330	1 250	550	59 640	28 170

Table 2. The number of students, teachers and degrees taken at universities, and government expenditure of higher education.

	Number of Students Autumn 1971		Teachers Autumn 1971	Students per Teacher 1971	Degrees taken in 1970			Government Expenditure mill. marks 1971
	Total	New			First	Lic.	Doctorates	
University of Helsinki	21,900	2,450	1,143	19.2	3,258[1]	151	117	95.8
University of Jyväskylä	4,600	800	230	26.0	666	14	2	21.4
University of Oulu	4,600	850	454	10.1	444[1]	20	22	46.4
University of Joensuu	450	230	28	16.1	–	–	–	2.4
University of Kuopio	–	–	2	–	–	–	–	0.6
University of Turku	7,300	1,100	547	13.3	976[1]	35	25	30.7
Abo Academy	2,700	450	152	17.8	241	13	–	7.8
University of Tampere	5,600	1,100	164	34.1	626	17	7	11.0
College of Veterinary Medicine	180	30	41	4.4	12	–	2	4.9
Helsinki University of Technology	4,900	850	464	10.6	516	40	18	39.8
Tampere University of Technology	720	190	81	8.9				16.9
Lappeenranta University of Technology	130	40	13	10.0	–	–	–	2.0
Helsinki School of Economics	3,200	600	114	28.1	472	3	2	6.1
Swedish School of Economics, Helsinki	1,450	270	63	23.0	161	2	–	2.8
Turku School of Economics	1,090	200	54	18.5	138	1	1	1.8
Swedish School of Economics of Abo Academy	480	100	28	17.1	67	1	–	1.0
Vaasa School of Economics	530	180	25	21.2	–	–	–	1.1
Total	59,740	9,640	3,603	16.6	7,577[1]	297	195	292.5

1) Includes licences in medicine.


UNIVERSITY TOWNS AND THE NUMBER OF STUDENTS IN FINLAND IN 1971
1) University
2) University of Technology
3) School of Economics
4) College of Veterinary Medicine
OULU
4 600
VAASA
500
KUOPIO
JOENSUU
450
JYVASKYLA
4 600
TAMPERE
6 300
LAPPEENRANTA
150
TURKU
11 400
HELSINKI
31 600
0
50
100 km

4. THE ADMINISTRATION OF HIGHER EDUCATION

4.1. The Central Administration of Higher Education

The administration of higher education and research has been treated in detail in Chapter I. In addition to the councils discussed in this chapter there is the Science Policy Council, which considers general principles of higher education. The Science Policy Council will be described separately on page 63.

4.1.1. National Council for Higher Education

The National Council for Higher Education was established in 1966. It has been reorganized three times. According to a decree issued in 1972 the Council assists the Ministry of Education. At the request of the Ministry, the Council considers problems of planning and development and the overall need for higher education and research, and it makes proposals on these matters. It pays special attention to the distribution of higher education throughout the country, to the distribution of various functions among institutions of higher learning and to the development of various disciplines.

The Cabinet appoints seventeen members to the Council for a three year period; each member has a vicemember. The chairman and the vice chairman are appointed by the Cabinet for one year at a time. A maximum of 15 permanent experts can be appointed to the Council by the Ministry of Education.

4.1.2. Council for Higher Education in Technology and Commerce

The institutes of technology and the schools of economics were subordinated to the Ministry of Commerce and Industry until 1972, when they were transferred to the aegis of the Ministry of Education. At the time of the transfer, the Cabinet appointed the Council for Higher Education in Technology and Commerce to propose measures required by the subordination of the schools of economics and institutes of technology to the Ministry of Education. The Council also submits proposals for co-operation between universities of technology and schools of economics on the one hand and industry on the other, as well as proposals for measures designed to improve the employment prospects for graduates in technology and economics.

The Council has a chairman and 21 members. The members are representatives of the government, teachers and students of institutes of technology and schools of economics, the business community, and other organizations in the field.

4.2. The Internal Administration of Institutions of Higher Learning

There are substantial differences in the administration of the various institutions of higher learning in Finland. At present there is no common legislation for university administration; such legislation is, however, under preparation.

The Rector is the head of a university. He is elected from among the professors. The Administrative Council – Consistorium Minor at the University of Helsinki -- is the main administrative organ. Generally it has the rector, the pro-rectors and/or deans and the assistant deans of the faculties as members. The most important questions are handled by the University Council (Consistorium Major or Consistorium) which consists of all the ordinary professors of the university.

The administrative staff of the university is subject to the Rector's Office. The head of the Office is Rector, but the administrative management of the Rector's Office is undertaken by an Administrative Director.

In private universities the administration differs from that in the state universities. Besides the academic councils, there are administrative organs which decide on economic affairs and which often have non-university members.

The universities are divided into faculties; the universities of technology into departments. The faculties in turn are usually made up of institutes.

The faculty is the basic unit of administration in the university. The faculty, as a governing body, consists of all the professors of the faculty. Its role is to supervise teaching, to comment on matters of education and research, and to make proposals concerning appointments to university posts.

The institutes generally cover only one discipline in which education is given, and the head of institute is a professor in that discipline. The other teachers and researchers of the institute participate in the administration only to the extent deemed expedient by the head of the institute. The institute gives instruction and pursues research in the discipline concerned.

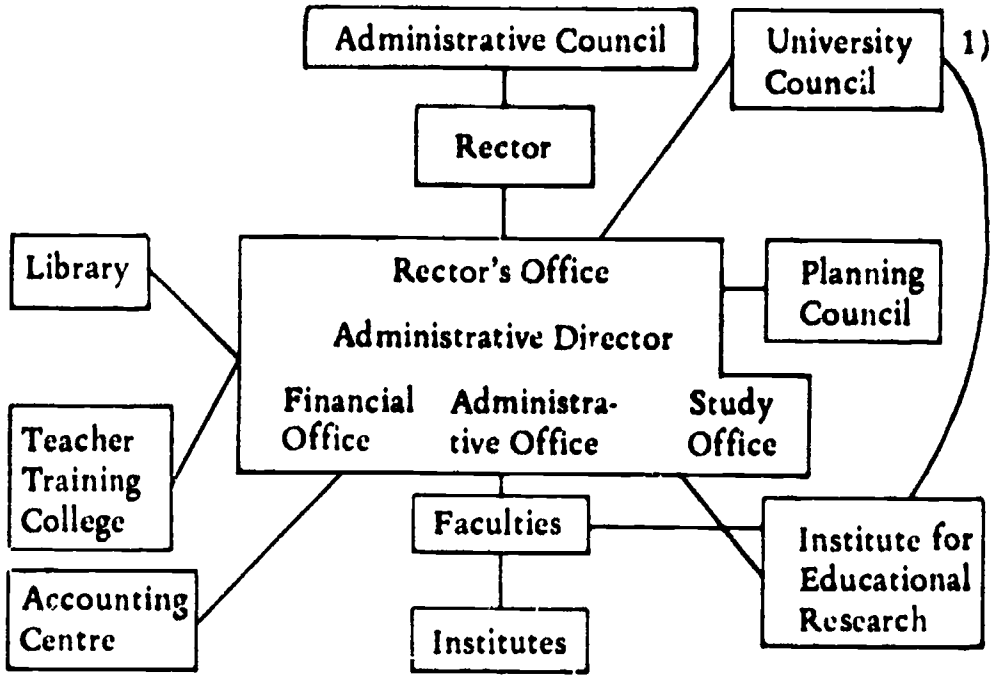
In smaller institutions of higher learning there are no faculties. The administration is usually the responsibility of the Rector and the Council of Teachers, the members of which are the professors of the institution. In the schools of economics, which are private institutions, there are also a Board of Trustees and a Governing Council which are the highest governing organs of the institution and make decisions in economis affairs. The Board of Trustees and the Governing Council consist of representatives of the business community; the Rector and vice-rector stand for the academic representation.

In the University of Helsinki and in private universities, the Chancellor is the highest administrative authority. According to present statutes, it is the duty of the Chancellor to promote research, to look after the well-being and the rights of the uni-

versity, to appoint officials and instructors, and to approve the annual curriculum of the university. The Chancellor of the University of Helsinki is appointed by the President of the Republic for a five year period from among three candidates nominated by the professors and assistant professors of the university. In private universities, the Chancellor is elected by a special collegiate body or by the university council.

Since the early 1960's, plans have been made to reform the traditional university administration, which proved unable to complete the growing tasks or to adapt to the great changes taking place in teaching and administration.

A demand for greater participation by junior teachers, other staff members and students in the governing bodies of the universities has been put forward with increasing vigour. Students have traditionally been represented in some governing bodies, but they have not had the right to vote. The first fundamental reforms aimed at the rationalization of administration were carried out in 1968 at the University of Jyväskylä and at the University of Tampere. After the reform not only professors participate in administration. The following chart illustrates new structures.



1) The University Council of the University of Jyväskylä deals only with some administrative questions.

5. UNIVERSITY DEGREES

5.1. External structure

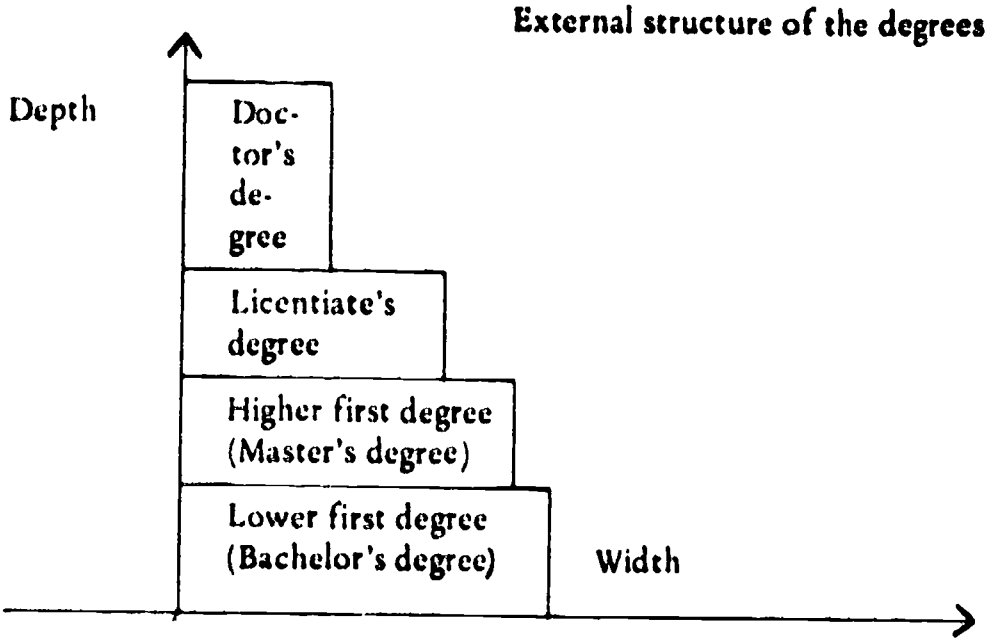
The degrees taken in the Finnish universities can be divided into two types: first degrees and post-graduate degrees.

There are two types of first degrees: higher and lower. A lower first degree, however, cannot be taken in all institutions of higher learning or in all disciplines. The higher first degree (fil.kand., valtiot.kand., dipl.ins., architect, etc.) is roughly equivalent to a Master's degree. The lower first degree is similar to a Bachelor's degree and in many cases has a specific name (hum.kand., luonnontiet.kand., etc.). The vocational degrees taken in the faculty of

agriculture and forestry (agronomi) and in schools of economics (ekonomi) are as a rule considered to be comparable with the Bachelor's degree. The lower first degree normally requires about three to four years of study, while the higher first degree requires about five to six years.

Post-graduate degrees can be taken after the higher first degree. The basic post-graduate degree is the licence[1]. As a rule five to nine years of study are needed to earn a licence, depending of the field of study and on the type of first degree. Those who have taken a licence have the right to work towards a doctorate. The time from the licence to the doctorate ranges from 2.5 to 13.5 years, depending on the discipline.

The structure of basic degrees and post-graduate degrees is illustrated in the foliowing figure:



1) The licences in medicine and veterinary medicine are often considered to correspond to the Master's degree.

5.2. Internal structure

Although the degrees vary more in their internal than their external structure, it is possible to sketch roughly their common internal features. The degree is earned by passing a number of examinations. These examinations cover specific courses of study or *syllabuses*[1], and the disciplines studied are divided into a major and minor fields. The syllabus for a major field is more comprehensive than that for a minor. The examinations are on three levels: *approbatur* (a), *cum laude approbatur* (cl) *and laudatur* (l). *Approbatur* is the lowest and *laudatur* the highest level.

Where this system of syllabuses is in use the degree is awarded after passing a certain set of examinations, submitting a thesis in the main subject – the *laudatur* or *pro gradu* thesis – and possibly completing some basic or supplementary courses.

The following figures illustrate the internal structures of the lower first degree (Bachelor's), the higher first degree (Master's), and the licence; this pattern is followed, with slight variations, in most Finnish institutions of higher learning.

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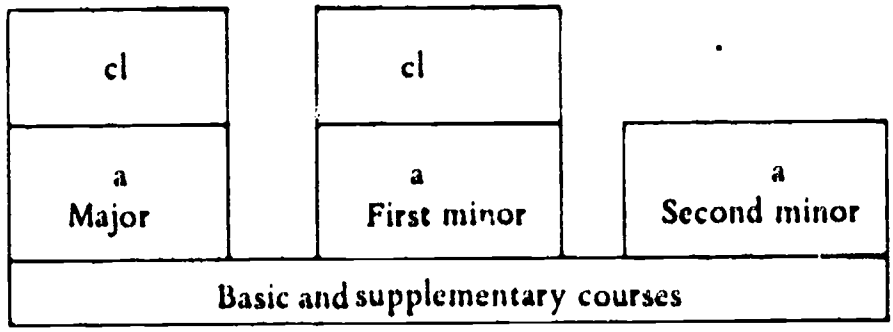
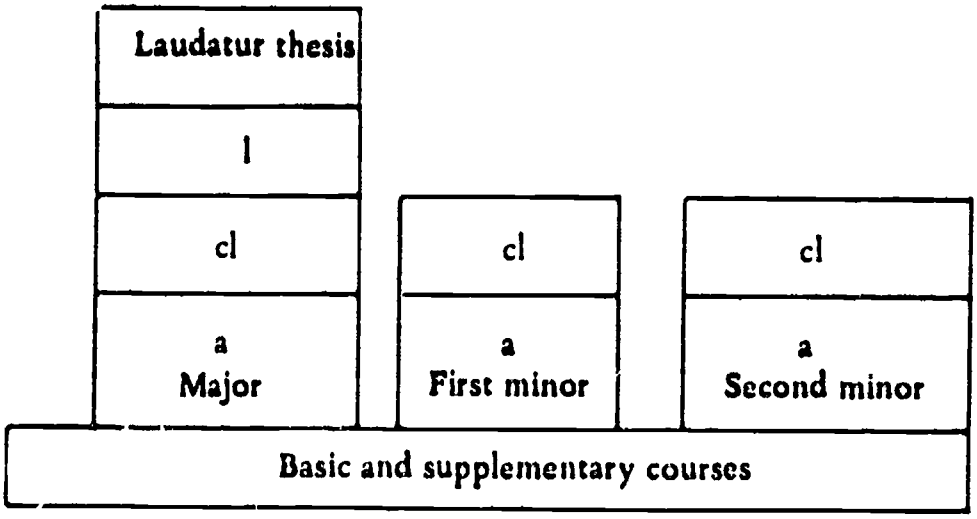
1. Lower first degree

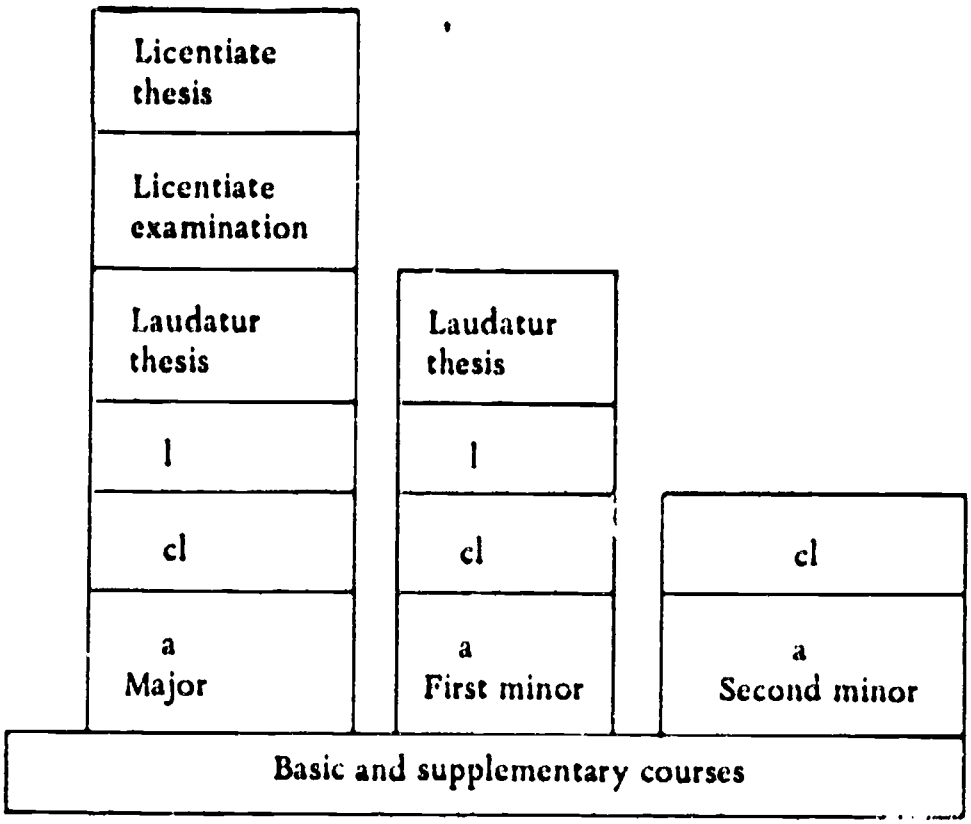


1) The disciplines in which instruction is given in Finnish institutions of higher learning have been listed in Appendix 1.

2. Higher first degree



3. The Licence



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Alternative syllabus combinations are accepted in some fields of study.

A doctorate can be granted to a licentiate after a public dissertation.

6. PLANS FOR THE DEVELOPMENT OF HIGHER EDUCATION

6.1. Legislation

6.1.1. Quantitative Targets

In April 1965 a Working Group appointed by the president of the Republic submitted its report on the measures to be taken for maintaining an international level of research and higher education in Finland. The corresponding act, based on the report, was issued in 1966.

When the law was issued, it was assumed that about two thirds of the persons passing the matriculation examination[1] would continue their education in institutions of higher learning. On this basis it was estimated that there would be about 55,000 university students in 1970. When all students enrolled in institutions of higher learning are considered, the actual number of university students in Finland was very close to the estimate. In the academic year 1969–70, the number of university students was about 56,000 and in the academic year 1970–71 about 57,500. It was forecasted that there will be between 75,000 and

1) Matriculation examination is roughly equivalent to GCE (A level) in Britain or the baccalauréat in France and the Abitur in Germany.

80,000 university students in the beginning of the 1980's. This number corresponds roughly to the target for 1980 which includes also the post-graduates.

The legislation for developing the system of higher education is aimed on the one hand at channelling the stream of students to the various fields of study so that the needs of society are satisfied as well as possible and the demand for highly educated labour met; on the other, it is designed to anticipate the growth and development in the various fields of study and to secure an adequate supply of teachers and facilities needed for instruction and research.

The Act on the Development of the System of Higher Education stipulates that there should be at least 60,000 places for students[1] in Finland at the end of 1981. Of these, at least 20,000 should be in the humanities, law, social sciences and related disciplines, such as business administration; at least 15,000 in science and agriculture and forestry; at least 11,000 in technology and at least 6,000 in medicine. Thus 52,000 places for students have been distributed among the four main fields mentioned in the Act. The decree on the development of the system of higher education from 1967 to 1981 stipulates that the remaining 8,000 places for students should be used to satisfy the needs emerging after 1970. The legislation on the development of higher education contains no other stipulations on the number of places for students and the proportionate distribution in various fields of study.

The following numbers indicate targets for structural changes:

1) 'Place for a student' is here used as a computational unit arrived at by calculating the average supply of teachers and facilities for teaching, research and administration needed by the institution of higher learning for one full-time equivalent student.

Field	Situation in 1966		Target for 1981	
(See table 1)	Students	Teachers	Students	Teachers
I. Humanities, social sciences	63.5	37.9	48.4	31.7
II. Natural sciences	19.4	23.6	24.2	31.4
III. Technology	11.2	18.1	17.7	22.0
IV. Medicine	5.9	20.4	9.7	14.9
Total	100.0 %	100.0 %	100.0 %	100.0 %

The decree on the development of the system of higher education sets minimum targets for the supply of teachers and facilities which are to be reached by the end of 1981. The decree indicates that in the humanities and social sciences there should be at least one full-time teacher for every 12 students. In science and technology, there should be at least one teacher for every eight students, and in medicine, at least one teacher for every six students.

The development of the full-time student[1] teacher ratio is illustrated by the following table:

	1967	1970	1972	Minimum target in 1981
Humanities and social sciences	22.0	19.5	17.6	8.0
Natural sciences	16.0	13.2	11.5	8.0
Technology	10.8	9.5	9.2	8.0
Medicine	minimum target, which has been reached			6.0

The decree states that in the natural sciences, technology and medicine there should be at least 25 sq.m. of floor space for each student and in the humanities at least 5 sq.m. of floor space for each student by the end of 1981.

1/ The place for student specified in the Act has been considered to be roughly equivalent to the concept of full-time student.

The development of the floor space per student is illustrated by the following table:

	1967	1970	Minimum target in 1981
Humanities and social sciences	5.9	6.3	5.0
Natural sciences	13.3	13.2	25.0
Technology	20.9	22.2	25.0
Medicine	25.8	20.8	25.0

It is to be noted that the targets defined by legislation are minimum figures that are supposed be reached in 1981. They can be exceeded. Furthermore these are nation-wide targets, and not targets for every institution of higher learning or every faculty. Thus in a faculty or an institution of higher learning which undertakes rather much research, the supply of teachers, staff and floor space per student may be greater than in an institution which concentrates mainly on instruction.

The legislation on the development of the system of higher education stipulates that the expansion of instruction and research facilities should take place in a consistent and controlled way over the entire 15 year period, which has been divided into sub-periods of 3 years. It is assumed that the rate of expansion will grow towards the end of the 15 year period. The Government is to submit a report to Parliament every three years on the plans for implementation of the law during the following three year period.

On the basis of the experience we have had so far of the effects of this legislation it appears that a plan, where only rough outlines for the development of higher education and research are set down by legislation, is useful. The legislation is relatively flexible; it specifies only the broad outlines of development establishing minimum targets and allowing for adjustments by the Ministry

of Education, the National Council for Higher Education, and the institutions of higher learning themselves.

6.1.2. Building of Institutions of Higher Learning

Principles for the building of institutes of higher education have been stipulated by the decree on the development of the system of higher education in 1967–1981. The decree indicates that both the size and the number of the institutions of higher learning should be increased so that adequate floor space will be available for the needs of teaching, research and administration by the end of 1981. At least of five sq.m. of floor space per student must be available for the humanities, law, and social sciences and related disciplines in 1981, as against at least 25 sq.m. for other disciplines. In the computation of floor space, premises owned by the institutes as well as those made available for their use on a permanent or temporary basis or rented to them are included.

In accordance with the legislation on the development of higher education, the Ministry of Education has prepared estimates of the need by institutions of higher learning for premises in 1981. In these estimates account has been taken of the needs arising from post-graduate education and teacher training. The targets for the development of floor space in institutions of higher learning in 1967–1981 are given in the table on page 39.

It is intended that existing institutions of higher learning will continue to use the premises which they own or which have been put at their disposal on a permanent basis. New institutions of higher learning, however, must generally start in rented premises or in premises put at their disposal temporarily. Temporary premises are also used to meet some of the requirements of the old institutions of higher learning.

Carrying out the building programme entails an investment of more than one million marks in constant prices over the period in 1967–1981. The University of Helsinki and the University of Oulu

Table 5. Development of floor space in institutions of higher learning in 1967–1981.

Field	Floor space beginning of 1967	Floor space to be removed from use in 1967–81	Need for additional floor space by end 1981	Total floor space needed at end 1981
	m^2	m^2	m^2	m^2
I Humanities and social sciences	114,000	12,000	65,000	167,000
II Natural Sciences	118,000	19,000	303,000	402,000
III Technology	92,000	31,000	234,000	295,000
IV Medicine	72,000	5,000	102,000	169,000
TOTAL	396,000	67,000	704,000	1.033,000

have the largest building programmes. The universities of Jyväskylä, Turku and Kuopio and the Helsinki University of Technology and the Tampere University of Technology also have large projects to be completed. A survey of the present situation shows that the growth of the floor space is lagging somewhat behind the intermediate targets set in the decree.

The sites for the main buildings of all our seventeen institutions of higher learning have been chosen. Possibilities to expand the universities of Helsinki, Turku and Tampere over a larger area are currently (1973) being studied. The overall planning of the sites and the expansion areas of the University of Jyväskylä, Kuopio and Joensuu is under preparation. For the other institutions of higher learning plans have already been made on the use of their facilities and sites for their further development.

The main buildings of the institutions of higher learning are or will be located as follows: twelve institutions will be either in the

centre of a city or very close to it, four in the outskirts of cities and one will be scattered in various parts of a city.

6.2. The Internal Administration of the Institutions of Higher Learning

6.2.1. Preparations for Reform

Since the late 1960's, the reform of the internal administration of the institutions of higher learning has been one of the major issues of educational policy in Finland. An overall reform of the administration of the institutions of higher learning has been under way for years, but because of great differences of opinion, the problem has proved very difficult to solve.

Plans for the reform of the internal administration of Finnish institutes of higher education include complete reform of the administration as well as an extension of decision-making to all members of the academic community. The aim has been on the one hand to improve efficiency and to make the administration more democratic. It is noteworthy that the efforts aimed at rationalising the administrative organization have been overshadowed by the "one man – one vote" issue.

The report of the committee for the development of the internal administration in the higher education system, the Nummisen Report, which was prepared in 1969, has played an important role in the discussion of administrative reform. This report examines the current administration of higher education and proposes alternatives for reforming the administration of higher education. (Committee report 1969: A 11; Swedish-language issue 1969: B 109.)

Primarily on the basis of this committee report, Government bills on the principles of the internal administration of institutions of higher learning and on experimental activities in the administration of higher education were submitted to Parliament at the end of 1969. The former bill suggested that the administrative

structure of the institutions of higher learning be reformed so that the central governing bodies in an institution of higher learning would be the council, the board of administration, and the Rector's office. The lower administration would have been divided into departments – instead of the present faculties – and the departments into institutes.

The bills concerning administrative reform were submitted to Parliament at the end of the year 1969. However, passing of the bills before the general election in 1970 was prevented by the opponents. Further preparations for reform have been carried out by the Ministry of Education. Several reports and studies have been made.

6.2.2. New Bill on the Reform of the Administration of Institutions of Higher Learning

On 8th June, 1972, the Government submitted a bill to Parliament on the internal administration of the institutions of higher learning. The bill which is based on extensive preparatory work includes proposals for laws on internal administration and on fair treatment, and proposals for revising some other statutes on higher learning.

The bill is based on a principle that an administrative system of an institution of higher learning should meet the requirements of democracy, legal security, efficiency, etc.

Arrangements will be made to guarantee a flexible handling of administrative questions. The right to decide on matters concerning higher education and research will be delegated as far as possible, but simultaneously efforts will be made to prevent matters requiring much office work and routine procedures from being scattered to too many administrative bodies. A suitable centralization of administration will be favoured. The Government bill was under debate during the Spring Session in 1973.

Only major issues are dealt with by the collegial governing bodies elected by instructors, researchers and students, whereas routine administration is assigned to officials.

According to the bill, an institution of higher learning should have a two-tier administration, the central administration (the upper level) and the institute administration (the lower level).

The central administrative decision-making bodies are the university council, the board of administration, the rector, and the office of administration. The basic unit for the administration of instruction and research in the institution of higher learning is the institute, where the administrative bodies are the head of the institute and the institute council. In connection with the reform, it is the intention to combine several institutes into larger units, which encompass several disciplines. In larger institutions of higher learning, the institutes can be grouped into departments. The administrative tasks of a department are carried out by the departmental council. The departments deal only with certain specific matters, primarily those connected with examinations and appointment of professors. In many cases, matters are submitted by the institute directly to the central administration and are not considered at all by the departmental council which is the intermediate body.

The tasks of the university councils would be to make drafts for and comment on laws and other regulations decided by Parliament or by central government offices; to make budget proposals and the long-term financial plans of the institution; to elect the rector, the vice-rector and the other members of the board of administration. Decisions on other major issues of central administration are to be made by the board of administration. The board of administration appoints i.a. the officials who are not appointed by the President of the Republic, the Cabinet or the Ministry of Education.

The institute council deals with matters concerning instruction and research in the institute and decides, among other things, on the use of funds granted to the institute. It also compiles the syllabuses of the institute. The institute council will not, however,

decide in detail on research topics; the researchers should be free to use the resources in the way they prefer.

The rector is responsible for the management and supervision of activities carried out in the institution of higher learning. The rector is assisted by the administrative manager who is the head of the office of administration.

The office of administration prepares matters to be dealt with by the governing bodies and makes decisions on matters which do not belong to any other administrative body. Decisions on matters to be dealt with by the governing bodies are made on a referal basis. The referendaries[1] submitting the matters to the governing bodies are officials in the office of administration.

In the supporting evidence for the bill, the importance of democracy in the administration of an institution of higher learning is emphasized. The council of the institution is elected proportionally with a secret ballot on the basis of universal suffrage, where every member of the community formed by the institution has an equal vote (one man -- one vote). One half of the institute council members are elected from the instructors and other personnel and the other half from the students. In the election, every person can vote for one candidate from each group (one man -- two votes).

The board of administration is elected by the university council through proportional voting. In addition to the elected members, the board includes *ex officio* the rector as chairman and the vice-rector as members. The departmental council includes the heads of institutes of the department and two members from each institute council elected by the councils from their own members.

The proposal for the new administrative system includes, however, certain clauses concerning competence. In recruiting academic staff, the competence of the candidates will be judged

1) A referendary is an official who has the right to prepare matters, to obtain statements concerning them and to submit them to the governing bodies.

only by members of the administrative body who have an equivalent standing. A similar procedure is followed in assessing doctoral theses. It is possible to invite qualified persons from outside the institute to participate in these decisions.

The rector, the heads of the institutes and the departmental chairmen must be professors or doctors. The head of the institute must also be an instructor in the institute.

When the proposal for the bill was made, one major aim was to ensure that the administrative system works efficiently. The responsibilities of the various administrative bodies will be carefully defined. The institutions of higher learning would be guaranteed a sufficient number of officials to prepare matters. It would also be their responsibility to control the work of the administrative bodies.

The new system will be implemented by a decree, in the beginning of 1975 at the earliest.

The Main Administrative Bodies according to the Government Bill:

COUNCIL

- is the highest decision-making body elected by universal and equal suffrage,
- has 18–60 members with a two year term of office,
- makes proposals and gives statements for laws and decrees and other regulations, which are to be decided upon by the central government; compiles the regulations to be adopted by the institution of higher learning itself,
- elects the rector, the vice-rector and the other members of the board of administration,
- approves proposals for budgets and long-term financial plans.

RECTOR

- must be a professor or a person with a doctorate,

- has term of office of two years,
- is responsible for the management and supervision of activities at the institution.

BOARD OF ADMINISTRATION

- comprises the rector and the vice-rector (max. 3), and 6–12 members elected by the council through proportional voting,
- prepares matters to be dealt with by the council,
- appoints officials – with the exception of clerical and service staff – who are appointed by the institution (professors and other officials are as a rule appointed by the President of the Republic, the Cabinet or the Ministry of Education),
- makes decisions on other matters assigned to the board of administration (major issues concerning the general administration of the institution).

OFFICE OF ADMINISTRATION

- is an administrative unit to which all administrative officials of the institution belong,
- is directed by the administrative manager subordinated to the rector,
- is responsible for the referendary process, the preparation of matters to be dealt with by the governing bodies and the implementation of decisions,
- makes decisions on matters which have not been assigned to any other administrative body (the Office of Administration is thus the general administrative body of the institution),
- has the duty to ask a governing body to reconsider a decision which is contrary to law.

DEPARTMENT

- only fairly large institutions of higher learning have departments.

Department Council

- comprises heads of all the institutes of the department plus two members from each institute elected by the institute

councils among their own members,
- considers the general structure of the examinations in the department,
- suggests candidates for professors, assistant professors and docents,
- evaluates the theses for doctorate and licence,
- awards degrees and vocational diplomas.

In an institution with no departments, these matters are dealt with by the institute council, the board of administration or a special body.

INSTITUTE

The institute is a basic unit of administration for research and instruction. It is the intention that several institutions should form relatively large units comprising various disciplines. In some cases it will be possible to establish one institute for basic instruction and another institute for research and further scientific education in the same discipline.

Institute Council

- comprises the head of the institute as chairman and 6 to 16 other members,
- half of the council consists of teachers and other staff members and the other half of students. The members are elected by universal and equal suffrage. Every one connected with the institute (teachers, auxiliary staff and students) participate on an equal basis in the election of both groups.
- deals with matters concerning the general organization of activities in the institute, the general framework for research pursued at the institute and the instruction given by the institute.
- draws up, i.a., proposals for the syllabuses of the institute, decides upon the use of appropriations granted to the institute and makes proposals concerning the appointment of junior teachers.

Head of the Institute

- must be a full-time teacher or research worker with a doctoral degree,
- is chairman of the institute council,
- is responsible for the management and supervision of the activities of the institute,
- makes decisions on matters not assigned to the institute council.

6.3. Admission policies

In recent years much attention has been given to defects in the admission policies. Therefore, the Ministry of Education has considered necessary to revise the methods of selection.

Up to now students have been selected primarily on the basis of their performance on the matriculation examination and the quality of their senior secondary school certificates. People with a different basic education have started to apply to university-level institutions; in addition to vocationally orientated education, these institutions are assuming an increasing role in raising the level of knowledge regardless of its immediate instrumental value. There is thus an urgent need to revise admission criteria.

The points to be considered are the future development of educational tasks, the elimination of blind alleys encountered in different fields, the equalization of educational opportunity for various social groups and the expansion of facilities for voluntary and further study.

As far as the individual is concerned, it is essential to define the basic requirements for each line of study. How the necessary qualifications have been obtained should be of minor importance.

The percentage of students in Finland admitted to university-level institutions of education was about 12 % of the whole age group at the beginning of the 1970's and will be about 20 % at the beginning of the 1980's. Higher education is a prerequisite for the technical and economic development of society.

In a discussion on the importance of selection, it should be remembered that universities and other institutions of higher learning have capacity for only a limited number of students which cannot be increased suddenly without lowering the standard of teaching. Particularly in fields of study leading to strictly defined professions, it is necessary to take account of the balance between supply and demand. In the early 1970's the emphasis will be on increasing the opportunities for academic studies and on improving the conditions of study. The general objectives include abolishing of unnecessary examinations and intensifying instruction and distribution of information.

An attempt should be made to divide the criteria for admission into two groups: first, the general level of knowledge and readiness for study, and second, the specific qualifications for the field of study. There should be a centralized system of student selection, or cooperation between different university-level institutions (= integrated selection by field of study).

Competition between various professions is not considered relevant. Measures which might lead to more equal salaries include increasing the number of persons trained for fields suffering from a shortage of qualified people, increasing financial support (loans) for students, lowering admission standards to increase horizontal mobility, increasing further training and retraining, and improving conditions of basic education in less popular fields. From the viewpoint of society, these measures would affect the selection of students more favourably than for example the use of aptitude tests on homogeneous groups of prospective entrants.

Achievement in the matriculation examination and success in the entrance examinations get different weights in different institutes. The admission criteria are standardized only for law and technology. The total number of points on the matriculation examination and the marks in the different subjects have been measures of school achievement; these are standardized over the whole country. Further items are the mean of the marks on the school certificate and individual marks in various subjects. The

admission criteria also include such items as previous studies completed in the institution to which admission is sought and, in some fields, practical training. In certain cases the completion of military service is taken into account.

The admission criteria include: sufficient basic knowledge, adequate conditions for succesful study, motivation for studying, interest in the field for which admission is sought and factors other than those revealed by school achievement.

The following conclusions concerning the admission criteria may be drawn:

1. School achievement should be considered according to the field of study, and there should be uniform selection procedures in each field at all universities.

2. A selection index of school achievement should be made for each field of study separately.

3. Entrance examinations should not require unreasonable preparatory study or extensive courses.

4. Further data should be accepted as supporting evidence for admissions (it would be assembled in connection with the application for admission):

a) special interests and experience should be included in the selection index, and

b) certain factors should be subject to consideration but not included in the index.

5. A certain number of places should be reserved for those who have not passed the matriculation examination and for foreign students. Alternatively separate examinations for them should be set. In any case they should meet the basic requirements.

If national examinations can be made to reveal both the readiness hitherto indicated by school achievement and other

types of readiness, the entrance examinations organized by individual universities in various fields of study will become less important.

6.4. Reform of the System of Degree Examinations

6.4.1. Reform of First Degree Examinations

In 1968 the National Council for Higher Education approved a report which proposed that the examination system in the faculties of the humanities, mathematics and science, and the social sciences be put on a credit point basis. The credit point system is aimed at improving the efficiency and organization of studies, as well as increasing flexibility and the comparability of various examinations.

A credit point is a unit indicating the estimated work required for acceptable performance. It has been estimated that a full-time student can earn 40 credit points annually. Since the academic year has 40 weeks, one credit point is equal to one week of full-time study.

According to a proposal by the National Council for Higher Education, 120 credit points should be required for a bachelor's degree and 160 credit points for a master's degree. It should then take an average of three years of full-time study to earn a bachelor's degree, whereas the master's degree would take four years. The Council proposes a gradual transition to this system. A long term goal would be one basic degree based on a credit point system.

Once the Council had submitted its proposal, the Ministry of Education launched extensive preparatory work with an eye to the implementation of the reform. A committee on university degrees in science, humanities and the social sciences has carried out preparatory work on the reform of examinations since the be-

ginning of 1970. At the beginning, the committee specified the targets on which the reform should be based. (1) *Targets concerning efficiency* aim at shorter and more concentrated studies and at minimizing the number of drop-outs. A meaningful structure of studies and splitting of large study units into smaller ones should promote achieving this aim. (2) *Targets concerning flexibility* aim at increasing the freedom of choice for students. Combining various methods of study, interdisciplinary programmes, flexible combining of courses, and continuous revising of contents and methods of studies will be encouraged. (3) *Targets concerning creativity, motivation and a critical attitude* aim at increasing the personal motivation to study and developing a critical mind. This involves maintaining creativity in a large university, reducing competition as a source for motivation, and improving social conditions for studies. (4) *Social targets* include taking account of developments in the labour market and the changes in the hierarchy of the professions in order to reduce distance between the university and its environment, to emphasize the social role of education and to develop the international comparability of qualifications.

The committee finished its report at the end of 1972. It proposed an extensive reform program to improve the quality of educational activities in general and study programs in particular. Some of the reform ideas of the committee are already being tested at the university of Jyväskylä, and overall implementation is under preparation.

6.4.2. Post-graduate Education

In 1970, the National Council for Higher Education submitted a report on the reform of post-graduate examinations.

The Council proposes a two-stage examination system. In most fields of post-graduate study, there should be two alternative branches of study. A certain amount of instruction and some

examinations will be included in post-graduate education. The doctoral thesis should be completed under efficient guidance.

The two-stage examination system would include a higher first degree and the doctor's degree. The licentiate would be an intermediate degree; it would not be an integral part of the doctoral programme though.

The licence would primarily indicate fulfilment of the requirements of a vocationally oriented post-graduate education. The requirements of an academically oriented education would be met with the doctorate. In some disciplines, the difference between these two types of targets is negligible, and the degree programme for post-graduate studies in these fields would be the same.

When the system of examinations for post-graduate studies was outlined by the Council, the assumption was that the first degree in fields other than medicine and education would take three years of full-time study. It now seems, however, that the estimate of three years for a first degree is not realistic, and it may be necessary to revise this period to four years.

The Council proposes in its report that the doctorate should be traditional type of degree and require four years of full-time study after the first degree. Prerequisites for the doctorate would be 60 credit points in the discipline in which the degree is to be taken. The doctorate would be in one discipline which should be associated with the subject of the thesis. The total amount of time of full-time study in the subject, would be four years.

The first phase for the doctorate would consist of two years of full-time study after the basic degree.

The second phase would consist of completion, under guidance, of the doctoral thesis. The completion of a doctoral thesis would take full-time students about two academic years. Students working on their doctoral theses would get regular guidance from a professor in the subject, who should have at a time a maximum of five full time students or two research groups under his guidance. The total time for a doctorate would then be around seven years. Access to post graduate studies should also be arranged for those who have a regular work.

In cases where the education is vocationally orientated, the first phase of study for a doctor's degree is a licence; it would be necessary to specify by discipline the combinations of subjects which could be included in the same licence.

The share of post-graduates in the total student population should grow gradually, according to the proposal of the Council, from the current 5 – 8 % to about 20 % in 1981.

6.5. Development of Instruction in Higher Education

The Ministry of Education is preparing a comprehensive plan aimed at outlining by university a nation-wide programme for the development of higher education. The plan includes:

1. The overall development of higher education (development of educational targets, methods and material);
2. Research on higher education (research concerning the tasks, the framework and the activities of institutions of higher learning);
3. Training of teachers for higher education;
4. Information and general services for teachers, researchers, planners and decision-makers in Finland and abroad.

In the development of educational methods, special attention has been paid during the beginning of the 1970's to the use of television. The committee on televised instruction appointed by the Ministry of Education submitted its report in the spring of 1971[1].

The committee proposed that extensive research and experiments should be started. The experimenting should cover as many fields of higher education as possible.

1) "Report of the Committee on the Use of Television in Higher Education in Finland." Ministry of Education, Helsinki 1971.

According to the committee report it will not be possible to make decisions on the extent to which television can be used in higher education in Finland until the results of the research and experiments are available. As a result of the committee report, the Ministry has launched several experiments in various universities, and some more have been designed. The intention is, however, to prepare as soon as possible a long-term plan for the development of televised instruction on the basis of the results of the experiments.

The use of new teaching aids has also been planned by the committee on the development of language laboratory instruction for higher education, which also submitted its report in the spring of 1971. This committee has compiled instructions on the planning and use of language laboratories[1] as well as instructions on how language laboratory programmes should be drawn up. Moreover, the committee has proposed the establishment of a national centre of language laboratories. It seems likely that such a centre will be established in the next few years. On the basis of the proposals of the committee, the experimental compilation of new language laboratory programmes has been started. The intention is to establish a centre of language services in each institution of higher learning; the centre will have its own staff and sufficient technical equipment.

Research concerning higher educational institutes takes place on a fairly extensive scale; coordination of this research on a nation-wide basis is part of the plan for the development of higher education discussed above. Research concerning institutions of higher learning is divided between research pursued through commissions set up by the Ministry of Education on a nation-wide basis and research pursued by individual institutions of higher learning. A key body in the national research concerning insti-

1) "Specifications for the Planning, Dimensioning and Use of Language Laboratories." Ministry of Education, Helsinki 1972.

tutions of higher learning will be the Institute of Educational Research at the University of Jyväskylä.

6.6. Arrangements for the Financial Support of Studies

The system of financial support for studies aims at securing equal opportunities for all individuals to obtain an education which is meaningful for the individual and society alike, irrespective of social, economic, and regional factors. The purpose is to develop social conditions for studying so that an individual's education would depend exclusively on his talents, capabilities and expectations.

The Finnish system of financial support for studies covers all persons pursuing post-comprehensive school studies. At universities and institutions of higher learning, support can be granted only for studies towards the higher first degree – the Master's degree. Special legislation applies to the training of scientists and to research in general.

Support for studies in institutions of higher learning is administered by the State Centre for Aid to Education and the committees for financial aid to education. The State Centre for Aid to Education was established in 1969 in order to deal with the financial support of studies. The State Centre for Aid to Education has a board of administration where the Ministry of Education, the Ministry of Finance, the financial institutions and the teachers and students of the educational institutions covered by the support system, as well as the manager of the State Centre for Aid to Education are represented.

The committees for financial aid to education are local boards subordinated to the State Centre for Aid to Education; they act independently in granting funds to students of various educational establishments. Each institution of higher learning has a committee for financial aid to education. A committee for financial aid has six members, three of whom must be representatives of students appointed by the students of the institution themselves.

Financial support for studies is provided in the form of grants from State funds and in the form of low-interest loans, where part of the interest is paid by the State, which also acts as guarantor. Qualifications for obtaining a grant are ordinary progress in one's studies and a lack of means. When the means are assessed, attention is paid to the income and property of the applicant and his spouse and, in cases where the applicant is considered to be dependent on his parents, to the income and property of his parents. When low-interest State-guaranteed loans are granted, no attention is paid to the financial position of the applicant's parents.

In 1973 about 15 % of the students at institutions of higher learning were entitled to grants; the size of the grant is currently Fmk 500--700 a year. (US $ = Fmk 3.6).

Study support in the form of loans has been granted each year to 50 per cent of the students on an average. The amount of a student loan is based on the annual cost of studying, and the maximum amount lent to a student in a year is 5,500 marks. Finnish citizens studying abroad get a maximum amount of 7,200 marks a year.

The student loan is an ordinary personal loan from a financial institution; the guarantee is provided by the State, which also pays an interest subsidy so that the student pays interest at a rate of 4 per cent during the time of studying and for about 1.5 years after the completion of his studies. The repayment of the student loan normally starts 1.5 years after the completion of studies. The length of the repayment period is twice the length of the period for which the student received the loan.

One of the grounds for supporting studies in the form of loans is that the student himself bears part of the cost of his education and thus uses in advance part of the financial benefit he generally gets from his education. Efforts are made to increase gradually grants paid by the government. The student organizations have specified a target of study support half in the form of loans and half in the form of grants.

6.7. Housing for Students

The question of housing for students is closely connected with general housing policy and with the position of younger persons in the housing market. Young people who start their studies or take a job either do not find it possible or do not wish to buy a flat. The increase in the building of ordinary rented housing facilities together with the development of arrangements for the financial support of studies provides grounds for the solution of the students' housing problem.

The student organizations have borne the brunt of the responsibility for the building of housing suitable for students and for the provision of rented housing to students. The construction of housing by the student organizations is primarily aimed at increasing substantially the number of flats for students. Lowering of the level of costs is necessary in order to satisfy the need for housing without reducing the space available for each person. The intention is to achieve this through changing the type of housing and through making the projects more extensive. The actual demand for accommondation and the financial constraints are the major factors controlling the level of housing.

It was not until the mid-1960's that the government started to support substantially the construction of housing for university students. The support was at first given as loans from the Ministry of Education for the construction of student housing. At the beginning of 1967, the present system was adopted, in which the National Housing Board, by virtue of the law on the construction of housing, grants loans to student organizations for construction activities.

In accordance with the current law on house building, the minimum amount granted each year for the construction of flats for students is 10 million marks. In the last few years, however, it has been possible to grant about 20 million marks a year for this purpose.

At present most students have to find housing in the open market.

The improvement of the legal security and the level of housing, particularly of those who live as tenants, has been recognized as a necessity. The best solution to the students' housing problem would be to have student organizations or related bodies act as lessors. In the largest university towns the student unions or the foundations which they have established have started to take care of the building of student housing. One example of this can be found in the activities of the Foundation for Student Housing in the Greater Helsinki Area, established in 1969, which built 350 flats for students in its first year of operation. It is the goal of the Foundation to provide enough housing for students that studies will not be hampered by the lack or poor quality of accommodation. Owing to limited financial resources, a target of the construction of at least 1,000 flats each year has been set for the period 1972–1981; it is also the aim to increase the supply of student housing by other means.

The goal in the location of dwellings is to create a natural and socially rewarding environment, where there are representatives of different social and age groups. Separate campus areas should be avoided. Comfort, safety and a certain level of services are regarded as rights that belong to all age groups. The question of housing for students is an organic part in the planning of education institutions. This is why the aim is to solve housing problems at a time when other planning takes place.

6.8. Students' Health Services

Students are entitled to medical care provided by society. Health facilities, however, have been organized by students themselves or have been furnished at the discretion of the educational institutions; only certain statutory care has been provided by the national health service. To provide medical care for university

students, the students have established the Foundation for the Medical Care of University Students. As a result of the activities of this Foundation, health services for university students can be considered relatively satisfactory, although the lack of support from society has made the activities of the foundation financially difficult.

The Committee for the Student Health Services appointed by the Cabinet has reported the grievances and shortcomings in health services provided for students of various educational establishments. The Committee has also proposed general targets for the provision of the health services to students. The committee report given in 1971 serves as the basis for the development of health services for students.

According to the proposals of the report, health facilities for students are to be an integral part of the national health service arrangements. The national health service will provide all health services for students with the exception of certain services required specifically by students. The integration of students' health facilities into the national health service is based on the National Health Act, which came into force on 1st April, 1972. The health services for students are provided by the health centre of the local authority in which the educational establishment is located or by a section of the health centre particularly intended for the use of students. In addition, hospital and dental care for students must be provided by the local authority.

To cater for the special medical needs of students, the Committee proposes that a Students' Health Service Council be appointed to assist the National Medical Board. The administrative bodies and the student organizations of the field are to be represented in the Council. The Committee further proposes that a Centre for Students' Health Services be established for the purposes of research, planning, health education, and information related to students' health services. The activities of the Centre should be financed with government funds.

The Committee proposes that most of the costs of the students' health services be financed through national health insurance.

The national health insurance system would compensate the local authority 85 per cent of the cost of out-patient care supervised by a general practioner and 75 per cent of the costs of health services provided by a specialist and 75 per cent or the cost of dental care. The remaining cost of these services would be borne by the students themselves.

A major part of the students' health examinations and personal consultation services is to be financed through the national health insurance system. The rest would be financed by the local authority, which would obtain subsidies from the central government for this purpose. The cost of the administration of the system and the maintenance of the Centre for Students' Health Services would be paid by direct appropriations in the State Budget. The total cost of these arrangements will be about 19 million marks. Preparations were under way at the beginning of 1973 for the overall reform of the system of health care on the basis of the proposals made in the Committee Report.

III RESEARCH

1. ADMINISTRATION AND ORGANIZATION

1.1. Research Administration

The position of Parliament, the President of the Republic and the Cabinet as well as the Ministry of Education in the administration of higher education and research has been discussed in the section "Administration of Higher Education and Research", on pages 7–9. Other aspects of research administration are discussed below. The national organization of higher education and research is illustrated by a chart on p. 72.

1.1.1. Science Policy Council. (This body was previously called the National Science Council)

Scientific research and science policy are developed by all the ministeries under whose aegis scientific research is pursued. The development of research must be co-ordinated and meaningful for the general development of society. A powerful body operating on a high level is needed to co-ordinate the projects of various branches of government and to see that resources are used correctly. The Science Policy Council, which is the highest science policy body in Finland, assists the Government in matters concerning scientific research. It is responsible for all scientific research irrespective of the ministry to which it is subordinated. Important matters of principle as well as financial matters connected with the co-ordination, development and direction of scientific research and education are considered by the Science Policy Council; it also carries out studies and makes plans con-

cerning these matters. The Science Policy Council is also responsible for Finnish participation in international scientific research.

Proposals by various ministries for the development of research are first dealt with by the Science Policy Council and later submitted to the Government for decision.

The chairman of the Science Policy Council is the Prime Minister; its members are six ministers, the chairman of the Central Board of the Research Councils, the chairman of the National Council for Higher Education, and five additional members appointed by the Government. The secreteriat of the Science Policy Council is in the Section for Scientific Affairs of the Ministry of Education; the Head of Section for Scientific Affairs is the Secretary of the Science Policy Council. A working party, composed of officials from various ministries, has been formed to prepare matters to be submitted by the ministries to the Science Policy Council.

1.1.2. Ministries

In Finland research is pursued in institutions and other units subordinated to several different ministries. The administration of research in Finland could be called semi-centralized, since the main office dealing with research is the Ministry of Education, to which all Research Councils are subordinated. In addition, all basic research is subject to the Ministry of Education.

The administration of applied research, however, belongs to the ministry whose area of responsibility covers the science in question. Hence the administration of applied research in agriculture and forestry belongs to the Ministry of Agriculture and Forestry. Similarly, the administration of applied research in technology belongs to the Ministry of Commerce and Industry. Applied research in social sciences and in medicine belongs to the sphere of the Ministry for Social Affairs and Health. The Ministry of Defence is responsible for military research. The promotion of

The Main Building of the University of Helsinki from the year 1832. Architect C. L. Engel

Participants in a written examination, University of Helsinki

Student Housing at the University of Oulu

Entrance Hall at the University of Tampere

The Helsinki University of Technology

Students examining a bulletin board at the Helsinki School of Economics

Students voting in the annual election of the Council of the Student Union at the University of Helsinki

Miniature model of the University of Oulu construction plan

applied research in the field of environmental protection is administered by the Prime Minister's Office, to which the Commission for Environmental Protection is currently subordinated.

The co-ordination of research takes place in the Science Policy Council and the Academy of Finland. Ministeries can also make use of advisory bodies.

1.1.3. Academy of Finland

Finnish science administration was reorganized by the law and decree which were given at the end of 1969 and came into force at the beginning of 1970. The Academy of Finland, established in 1947, ceased to exist; the system of Research Councils was developed considerably. The new system adopted the name Academy of Finland because of tradition.

The old Academy of Finland, where the Fellows were distinguished scholars, had been subjected to a great deal of criticism, particularly because the working conditions of the Fellows of the Academy left much to be desired. The total number of Fellows of the Academy was 12; eight persons still hold their fellowships since appointment was for life. Representatives of art and science were members of the old Academy.

The system of Research Councils was introduced in 1950, following similar patterns as in Western Europe. At first, there were two Research Councils: one for the humanities and one for science, but in 1961 the number of Research Councils was raised to six. At the same time, a Delegation for Research Councils was established to co-ordinate the activities of the Research Councils. Research Councils were relatively independent from an administrative point of view, and the role of the Delegation in research administration was of minor importance.

At the beginning of 1970, the "new" Academy of Finland was created. It is the central body for research administration and is subordinated to the Ministry of Education. The Academy on Finland consists of the following bodies:

The Central Board of the Research Councils

The Research Council for Agriculture and Forestry
The Research Council for the Humanities
The Research Council for the Medical Sciences
The Research Council for the Natural Sciences
The Research Council for the Social Sciences
The Research Council for the Technical Sciences
The Administrative Office

The Central Board of the Research Councils has a dual function; it is a body for research policy on one hand and a body allocating resources on the other. The Central Board of the Research Councils has the following tasks:

- To take steps to improve the preconditions for research with particular reference to the planning and co-ordination of research and its financing; to follow the development of international scientific co-operation and to take initiatives to promote the purposeful participation of Finland in these activities; to investigate the requirements for the training of researchers and to take initiatives aimed at improving and developing such training.
- To take initiatives for the promotion of inter-disciplinary research and to control that sufficient attention is paid to inter-disciplinary projects.
- To authorize contracts for research projects.
- To submit proposals for the appointment of research professors.

The President of the Republic appoints the chairman of the Central Board of Research Councils for a three year period. The members of the Central Board consist of the chairmen of the six Research Councils and three persons appointed by the Cabinet. The members are in office for three years. The Secretary of the Central Board is the Administrative Manager of the Academy of Finland.

For specific questions, such as interdisciplinary and international matters, the Central Board has either permanent or temporary sections. Examples of these sections are the Environmental Section, the Section for Cooperation in International Research, and the Space Research Section.

The Central Board submits proposals to the Government concerning the distribution among the Research Councils of appropriations, research posts, and grants for senior researchers.

Within their respective disciplines, each Research Council has the following tasks:

- to promote research, with particular emphasis on research planning and the co-ordination of research activities carried out by universities, by State research institutes and industry, to maintain contacts with national and international research institutes and organizations, and to make plans for the development of research,
- to promote implementation of important research projects,
- to promote academic and professional publication and to distribute state support for academic publications,
- to grant appropriations to individual researchers and groups of researchers for well-motivated research projects,
- to appoint Fellows and research assistants and to award grants to senior researchers,
- to make contracts with groups of researchers on research projects, upon the authorization by the Central Board and on behalf of the State.

In addition to the chairman, the Research Councils have 9–14 members who represent the research which belongs to the sphere of the Research Council. The Research Councils, accordingly, are expert bodies who hold meetings at regular interval to make decisions on matters prepared for the meeting. Membership is an extra assignment; only the secretaries of the Research Councils are full-time officials.

The Academy of Finland has a total of about 100 experts as members of Research Councils and their sections. While Finland has no actual National Board of Research, the Academy of Finland corresponds to such a body by virtue of its functions. The Central Board of the Research Councils established in connection with the re-organization at the beginning of 1970 has a more important role from an administrative point of view than the previous

Delegation of Research Councils. In the re-organization, the Research Councils lost part of their autonomy, but they are free to decide on the use of funds allocated to them and on the recruitment of researchers.

Research resources allocated through the Academy of Finland are dealt with in more detail in chapter 2.

1.2. Research Organizations

The major organizations carrying out research in Finland are the institutions of higher learning, the State research institutes, and the research bodies of enterprises. Research is divided between these three sectors in the proportion 1: 1: 2. Moreover, there are a few research institutes maintained by non-profit private organizations, but their share in total research is relatively small. In 1969 research in Finland was distributed to various categories of research and development roughly as follows:

	%
basic research	10
applied research	40
development	50
	100

1.2.1. Universities

Research carried out in institutions of higher learning is, following Western traditions, highly researcher-centred. Research work belongs primarily to post-graduate members of the university, who tradionally have had considerable academic freedom. This is to say that the subject for research can be freely chosen from any part of the discipline. Thus the Government, the university or the university research institute cannot determine the subject of research. Research can naturally be channelled in desired directions with specific grants, but the aim is to allow all qualified researchers

in the universities to carry out the research which they wish to undertake.

Most research pursued in institutions of higher learning is basic research. In several disciplines, basic research is pursued exclusively in these institutions.

The research and development pursued in institutions of higher learning in 1969 has been estimated to comprise:

	%
basic research	60
applied research	30
development	10
	100

Development is pursued almost exclusively at institutes of technology and in the faculties of technology; applied research is pursued in the schools of economics, the institutes of technology, the faculty of agriculture and forestry, and to some extent in other faculties.

Universities do not alone satisfy all research needs; Research Councils, private foundations, and to some extent enterprises and foreign organizations grant funds to university members to cover research expenditure. For example many of the assistants needed in research work have been recruited with funds granted by Research Councils.

In Finland almost all researchers supported directly by the Academy of Finland pursue research in the institutes of the universities. The Academy of Finland, unlike the academies of many other European countries, does not have research institutes of its own. Fellows of the Academy of Finland have been placed in the institutions of higher learning to ensure close interaction between research and academic education.

In the research institutes of the universities, there are a number of research teams that work on the basis of a research contract made with the Government. Either some or all of the members of a team have been recruited with funds earmarked for research contracts.

Research contracts are made by the Government and particularly in the field of technology, by SITRA (the Finnish National Fund for Research and Development) and by individual industrial companies.

Some universities have independent research units and field work stations (e.g. the Institute for Educational Research of the University of Jyväskylä and the Research Institute of the University of Tampere).

1.2.2. State Research Institutes

The State maintains about 40 research institutes, in which applied research, product development, and control and testing activities are primarily pursued. The State research institutes are subordinated to various ministries according to their tasks. The largest research institutes are subordinated to the Ministry of Commerce and Industry and to the Ministry of Agriculture and Forestry. A list of the main State research institutes is given in Appendix 1.

The tasks of most State research institutes have been specified by law; the research pursued by them is strongly goal-oriented. Research assignments and resources have been tied to such an extent that the research institutes have difficulties in participating in international research projects. In some cases, funds for researchers working at State research institutes have been granted by Research Councils and by foreign organizations. State research institutes also obtain financial support from enterprises and from private foundations.

In 1969, the State research institutes employed about 800 researchers and about 1,600 auxiliary staff.

In addition to the research institutes directly subordinated to the Ministry of Education, the Ministry also provides financing for permanent projects which are of particular cultural interest for Finland (the Finnish language, its dialects, etc.). The units that pursue such research co-operate closely with the university institutes which do related work.

1.2.3. Research Institutes of the Private Non-profit Sector

In Finland private research institutes are maintained by scientific societies, foundations and funds which in turn receive State support. Examples of such institutes are the Wihuri Physics Research Institute of the University of Turku, the Sodankylä Geophysical Observatory of the Finnish Academy of Sciences and Letters, the Institute of Parasitology of the Finnish Scientific Society, and the laboratory of the Foundation for Chemical Research.

Most of these research institutes are connected with institutions of higher learning or at least co-operate closely with them.

1.2.4. Research Institutes of the Enterprise Sector

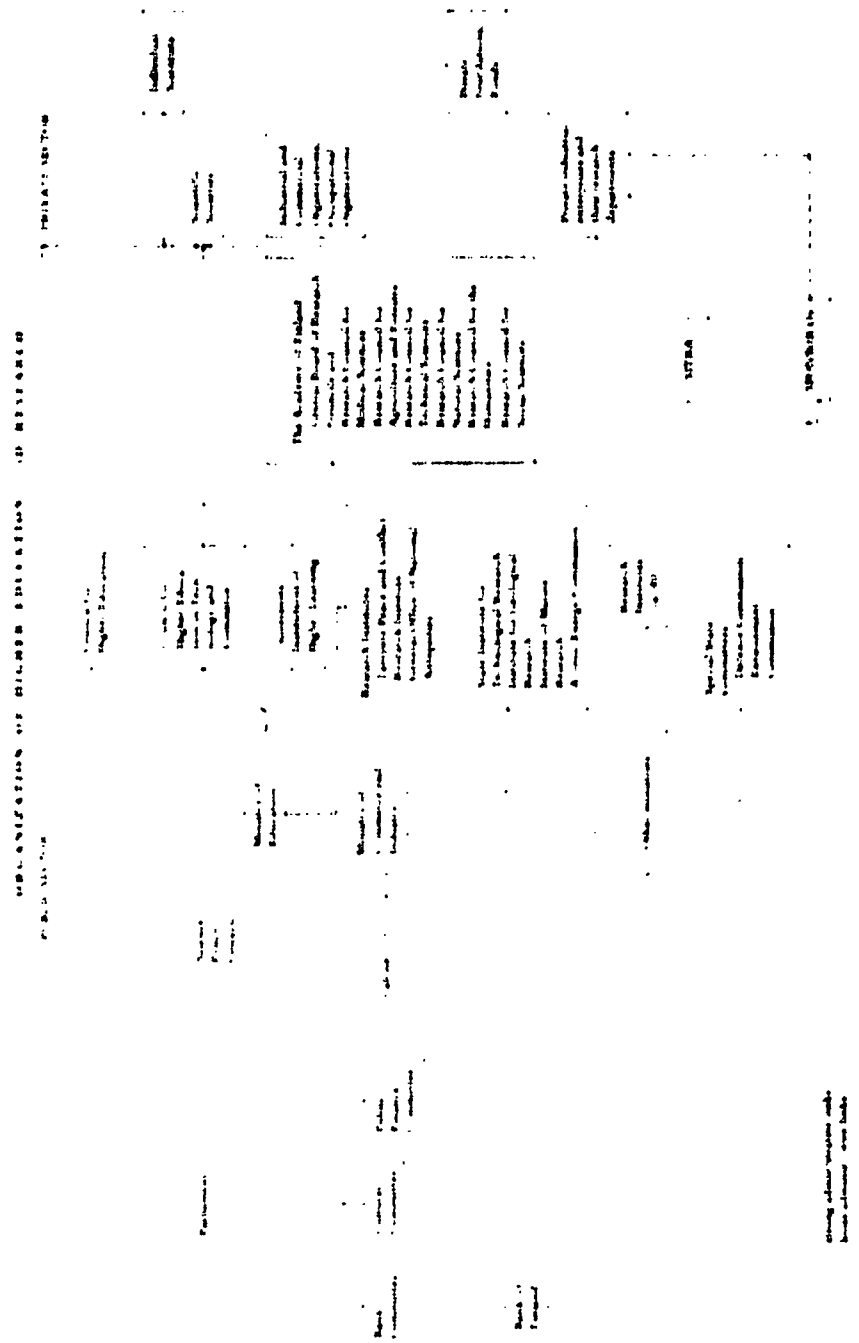
Both governmental and private industrial and business companies have research units for their own purposes. There are also joint institutions like the Finnish Pulp and Paper Research Institute. All this activity corresponds roughly to half of the Finnish research. In 1969 this sector employed about 5,600 persons, 1,200 of them people with academic qualifications.

In 1969, 214 companies declared that they pursue research and development of their own. The expenditure by industry on such research and development work in 1969 was about 1.1 % (about 132 million marks) of value added in industry. A major part of this research was financed by industry itself. The share of other sources of financing was small, viz. about 6 per cent.

The distribution of research and development pursued by industry over various categories of research in 1969 was as follows:

	per cent
basic research	2
applied research	30
development	68
Total	100

A detailed chart of the organization of higher education and research policy is presented below.



2. RESEARCH RESOURCES

Material as well as human resources are needed in scientific research, and diminishing returns apply to both these inputs. If we disregard the quality of researchers we may note that the number of researchers must stand in a certain proportion to the material research input, and that there is some optimal proportion which will optimize output. In Finland increasing attention is being paid to the size and use of research resources and approval has been given to the general principle which maintains that research is an instrument by which society can improve the quality of life. The quantity of resources allocated to research is not in itself an indication of the quantity or quality of research output. Nevertheless it gives a picture of the research activity in the country and makes international comparisons possible.

2.1. Manpower in Research

In addition to university staff, there were about 11,000 persons working in research during 1969 in Finland, i.e. about 0.24 % of the whole population. About 6,800 man-years were devoted to research (exclusive of universities). The number of man-years for researchers with an academic degree was about 1,800. The distribution of man-years, which is equal to the number of full-time researchers, over various sectors was as follows:

	R&D man-years	%
Enterprise Sector	4,087	60
Public Sector	2,437	36
Private Non-profit Sector	247	4
Total	6,771	100

There were about 3,000 persons with an academic degree within the institutes of higher learning (e.g. professors, lecturers, assistants

etc.), who pursue research as part of their work. It is almost impossible to estimate how much time they spend on research.

A consideration of the relation between the number of graduates in research and their research man-years on the basis of 1969 statistics shows that the output of a graduate researcher is about 0,6 research man-years on average; i.e., he devotes slightly more than 7 months a year to research. The relation varies from one sector to another. It is highest for researchers of the Academy of Finland (0.84) and lowest for researchers in the public administration sector (0.37). Despite a bias bue to mobility and similar factors these figures illustrate how research capacity is used. In all sectors there are scientists who devote themselves entirely to research. The relative number of full-time research workers is highest in state research institutes and in the Academy of Finland.

The Academy of Finland offers good opportunities for research. The Research Councils subordinated to the Academy of Finland have various types of researcher's posts and grants: these posts and grants are for a fixed period. The following table gives the number of these in 1971 and a forecast for 1974:

	1971	1974
Research professors	12	15
Senior Fellows	34	50
Junior Fellows	69	100
Research Assistants	140	200
Scholarships for Senior Researchers	30	75

The researcher's posts at the Academy of Finland are very useful, particularly for the research staff working in the universities. They provide a possibility for the researcher to concentrate on research work alone and free him from teaching and administrative duties. The research assistants' posts are important for training research. Junior and Senior Fellows are often absorbed in extensive

projects. Team-work is far from rare. A research professor generally collaborates with one or several research assistants or other employees of the Academy.

2.2. Financial Resources

In Finland expenditure on research and development in 1969 was about 300 million marks or 0.8 % of GNP. This was distributed to various sectors as follows:

	million marks	%
Enterprise sector	145.1	49
Government	74.5	25
Private Non-profit sector	7.7	3
Higher education	71.4	23
Total	298.7	100

The source of these funds was:

	million marks	%
Enterprise sector	136.0	45
Government	146.5	49
Private Non-profit sector	8.5	3
Higher education	5.2	2
Foreign sources	2.5	1
Total	298.7	100

The share of the public sector (Government) in the financing of the research activities of the enterprise sector was about 4 per cent according to a 1969 report. The enterprise sector covered about 92 per cent of expenditure arising from its own research activities. The share of the Government sector will obviously continue to grow in the next few years. The share of the Government in the research expenditure of higher education was 92 per cent.

Approximately 50 per cent of research and development is financed by the State. In 1969 about half of the sum, i.e. 75 million marks, was alloted to the Ministry of Education which distributed one fifth of it to the Academy of Finland; this share will be increased in future. Other sources of finance in the public sector are the Ministry of Commerce and Industry, and the Ministry of Agriculture and Forestry.

It is noteworthy that expenditure by the Ministry of Defence on research is relatively small in Finland.

Distribution of research expenditure in 1969 was as follows:

Discipline	Running ex-expenditure mill.mk.	Investment [1] expenditure mill.mk.	Total mill.mk.
Natural sciences, Technology	167	40	207
Agriculture and Forestry	29	6	35
Social Sciences	22	1	23
Medicine	19	3	22
Humanities	9	1	10
Miscellaneous	2		2
Total	248	51	299

The growth of funds invested by the public sector (Government) in research is shown by the following table:

(Source: the Science policy programme of the Central Board of the Research Councils, 1972.)

1) The distribution is estimated.

	Total, mill.mk	Growth in current prices, %	Actual growth, %
1967	111	18.9	8.0
1968	132	17.4	13.7
1969	155	14.2	10.3
1970	177	14.7	6.6x)
1971	203	18.7	13.5x)
1972	241		

x) estimated

3. TRAINING OF RESEARCHERS

As in other European countries, training of researchers in Finland takes place almost exclusively in institutions of higher learning. Even in cases where a person with an academic degree pursues research in a State research institute, in a research institute owned by industry or on a free-lance basis, he usually has a close connection with a university research institute. Guidance for work on a thesis for a licence or a doctorate is generally given by a university professor. Posts particularly suited for training researchers are those of university assistants, and research assistants in the Research Councils; the research grants also serve the purpose of training researchers. The project research funds granted by Research Councils are often used to recruit a number of persons who pursue post-graduate studies in addition to their ordinary work.

The number of research traineeships discussed above has increased as follows:

	1966	1972
University assistantships	1.086	1.441
Research assistants' posts in the Research Councils	70	160

There are some posts for the training of researchers in the State research institutes and in other public or private organizations.

Moreover, researcher training is financed by private funds. Post-graduate studies take place in two stages in Finland. The licence is taken first and the doctoral degree later. (Cf. reform plans, pp. 50 53.)

4. ADACEMIC SOCIETIES AND PUBLICATIONS

There are about 130 academic societies in Finland. Three of these are general societies, viz. the Finnish Academy of Sciences and Letters (established in 1908), the Finnish Scientific Society (1838), and the Academy of Technical Sciences (1957). In some disciplines, there are two or more societies, which elect a joint committee for international relations (e.g. with unions subordinated to the International Council of Scientific Unions).

In Finland most of the results of research are published in the publication series and journals of academic societies. There are 150 such series and journals. A major part of the activities of many academic societies is concentrated on publication. Two thirds of the funds of academic societies are used for this purpose. These societies derive most of their funds from governmental subsidies. The Government provides financing for publication, while the societies take care of the rest. The publication of academic series by commercial publishing houses is extremely rare in Finland. Some universities and research institutes have their own publication series, and there are also Nordic publication series in some disciplines. Indeed, there are a few disciplines where academic publication is exclusively on a Nordic basis. Finnish scholars naturally also use foreign publications to publish their work, and in this the English language is used most often.

Finland has five major academic libraries which act as central libraries[1] in their field: the Helsinki University Library, the Library of the Helsinki University of Technology, the Agricultural

1) Central library is a library which provides library services in its own particular field on a nation-wide basis.

Library, the Forestry Library, and the Central Library of Medicine. Moreover, each institute that pursues research has its own library.

5. SPECIAL FEATURES

As is clear from what has been said above, the Government plays a major role in the financing of basic research while enterprises provide most of the funds for applied research and development.

Finland has few research institutes maintained by the State which carry out basic research. However, in institutes subordinated to the Ministry of Education, such as the General Office of National Antiquities and the State Archives, some basic research is pursued. Most basic research is pursued in the institutes of universities. A fact worth mentioning is that the Ministry of Education receives each year about 10 million marks from State football pools and lotteries for the financing of research projects, expenses arising from publication (through academic societies), organization of conferences etc. Items such as these are accordingly not covered by appropriations in the State budget. Since their financing is dependent only on funds available from State football pools and lotteries, the aim has been to transfer these items increasingly to the category financed by budget funds.

Research administration and the financing of research have been arranged so that education and research in the institutes of higher learning are not differentiated either in administration or in the budget.

The current practice has been found harmful for both research policy and the allocation of resources. The act on the development of institutions of higher learning in 1967 1981 provides adequately for the development of higher education, but includes few general statements on the position of research. This law does not contain stipulations on the research facilities for teachers. The number of university instructors has grown more rapidly than the appropriations earmarked for research work at universities, and

thus the law has not improved the position of research in universities in relative terms.

Another factor conditioning research in Finland is the remote position of this country both in terms of language and geography. This makes the exchange of academic information between Finland and other countries relatively slow and expensive. Efforts have been made, therefore, to increase the opportunities for Finnish researchers to go abroad. A fundamental re-organization of scientific information services is currently under way.

6. PLANS FOR THE DEVELOPMENT OF RESEARCH

Science policy in Finland has been based on the tradition of academic freedom. Funds for research have been allocated on the basis of equality instead of the needs of the society. The role of research as a basis for innovation was first emphasized in the sphere of technology and subsequently in the social sciences and environmental studies.

An intensive debate on science policy and planning began in Finland at the end of the 1960's. As a result of this, we have outlined research policy for the 1970's. The fields of research that are of key importance for the development of Finnish society have been specified, and the means of implementation have been indicated. General research policy plans and specified objectives for each sector were first published by bodies responsible for technological research. During 1972 each Research Council developed a policy programme for the respective field.

In science policy planning, the Science Policy Council and the Academy of Finland have an important role, because they are responsible for the compatibility of the plans of various sectors and for the mutual weighting of these. Overall plans for the development of research have also been published by political parties. Efforts to increase material resources also fall in the sphere of science policy, and a meaningful allocation if these resources can

be regarded as the major task of this policy. A science policy revolution affects the content of research rather than the quantitative framework within which it is pursued.

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IV APPENDIX

1. INSTITUTIONS OF HIGHER LEARNING IN FINLAND

This appendix presents the institutions of higher learning in Finland.

In 1973 the University of Helsinki published a booklet entitled "Guide for Foreign Students". The booklet gives detailed information on studies at the University of Helsinki. It also tells about scholarships, accommodation, medical care, libraries and student life. The book is therefore useful for all foreign students who wish to pursue studies in Finland or are otherwise interested in information on university studies in Finland. The booklet can be obtained from the University of Helsinki.

The following list indicates the institutions of higher learning in Finland, the faculties and similar units, as well as the subjects in which instruction is given.

The address of each institution of higher learning is given after its name. For further information on the facilities for studying as well as other information on the institution, please write to it.

UNIVERSITY OF HELSINKI
Yliopiston kanslia
Fabianinkatu 33, 00170 Helsinki 17

FACULTY OF THEOLOGY
Subjects:
Exegesis; Church History; Practical Theology; Dogmatics; Theological Ethics; Comparetive religion; Church Sociology; Religious Education.

FACULTY OF LAW

Subjects:

Economics; Jurisprudence and International Private Law; Legal History and Roman Law; Private Law; Commercial Law; Land Reform and Water Law; Labour Law; Constitutional Law; Criminal Law; Judicial Procedure; International Law; Administrative Law; Finance Law.

FACULTY OF MEDICINE

Subjects:

Anatomy, Medical Chemistry, Physiology, Pharmacology, Pathological Anatomy, Bacteriology and Serology, Virology, Public Health, Pulmonary Diseases, Radiology (X-ray Diagnostics and Radio therapy), Internal Medicine, Neurology, Surgery, Clinical Chemistry, Psychiatry, Obstetrics and Gynaecology, Pediatrics, Ophthalmology, Oto-Rhino-Laryngology, Skin and Veneral Diseases, Forensic Medicine, Anaesthesiology, Clinical Pharmacology, Genetics, Neurosurgery, Physical Medicine and Rehabilitation, Dental and Oral Surgery, Cariology, Prosthetics, Pedodontics and Orthodontics, Dental Roentgenological Diagnostics, Paradontology.

FACULTY OF PHILOSOPHY

DIVISION OF THE HUMANITIES

Subjects:

Altaic Linguistics, Assyriology, Egyptology, English Philology, Aesthetics and Comparative Literature, Philosophy, Phonetics, German Philology, History, Oriental Literature, Education, Greek Literature, Theory of Music, Persian Language, Scandinavian Philology, Psychology, Romance Philology, Latin Literature, Sanskrit and Comparative Indo-European Linguistics, Slavonic Philology, Finnish and Comparative Folklore, Finno-Ugrian Ethnology, Finno-Ugrian Linguistics, Finnish and Scandinavian Archaeology, Finnish Language, History of Art, Russian Language and

Literature, General Linguistics, Finnish and Slavonic History of Thought.

DIVISION OF SCIENCE

Subjects:

Biochemistry, Zoology, Pharmacy, Physics and Nuclear Physics, Geophysics, Geology and Mineralogy, Geology and Palaeontology, Botany, Chemistry, Geography, Mathematics, Meteorology, Genetics, Radiochemistry, Theoretical Physics; Computer Science, Astronomy, General and Physiological Microbiology.

The Division of Science also includes the Department of Pharmacy.

FACULTY OF SOCIAL SCIENCES

Subjects:

Economics, Economic and Social History, Political History, Political Science, Philosophy, Social Policy, Social Psychology, Sociology, Statistics, Journalism and Mass Communication.

FACULTY OF AGRICULTURE AND FORESTRY

Subjects:

Agricultural Chemistry and Physics, Agricultural Economics, Agricultural Engineering, Agricultural Policy, Agricultural Zoology, Animal Breeding, Animal Husbandry, Business Economics in Forestry, Environmental Sciences, Farm Forestry, Food Chemistry and Technology, Forest Biology, Forest Mensuration, Forest Products Marketing, Forest Technology, Household Management, Home Technology, Horticulture, Limnology, Meat Technology, Microbiology, Nutritional Chemistry, Peatland Forestry, Plant Breeding, Plant Husbandry, Plant Biology and Plant Pathology, Forestry, Forest Economis, Dairy Science.

Moreover, the university has a number of separate institutes.

UNIVERSITY OF JYVÄSKYLÄ

Opintoasiaintoimisto
Seminaarinkatu 15,
40100 Jyväskylä 10

FACULTY OF EDUCATIONAL AND SOCIAL SCIENCES

Subjects:

Business Administration, Computer Science, Education, Philosophy, Psychology, Developmental Psychology, Social Policy, Sociology, Special Education, Statistics.

FACULTY OF THE HUMANITIES

Subjects:

Art History, English Philology, Finnish and Comparative Ethnology, Finnish Language, General History, Finnish History, German Philology, Literature, Phonetics, Romance Philology, Theory of Music, Social Science, Political Science, Scandinavian Philology, Latin, Russian Language and Literature, Speech Technique and Oral Expression.

FACULTY OF SCIENCE

Subjects:

Biology, Chemistry, Mathematics, Physics, Theoretical Physics.

FACULTY OF PHYSICAL AND HEALTH EDUCATION

Subjects:

Anatomy and Kinesiology, Physiology of Exercise, Technology of Physical Exercise, Physiological Hygiene and Public Health, Physical Education.

In addition to these, the University of Jyväskylä has i.a. a Teacher Training College and an Institute for Educational Research.

UNIVERSITY OF OULU

Opintoasiaintoimisto
Pakkahuoneenkatu 12,
90100 Oulu 10

FACULTY OF SCIENCE

Subjects:

Zoology, Botany, Limnology, Geography, Genetics, Biochemistry, Physiology, Microbiology, Physics, Geophysics, Geology, Chemistry, Mathematics, Applied Mathematics, Theoretical Physics, Astronomy.

FACULTY OF THE HUMANITIES

Subjects:

Archaeology, English Philology, Phonetics, German Philology, Economics, Education, Literature, Lapponian Language and Culture, Scandinavian Philology, Psychology, Public Speaking, Roman Literature (Latin), Finnish Language, Sociology, General History, Political Science.

FACULTY OF MEDICINE

Subjects:

Anatomy, Pharmacology, Physiology, Public Health, Clinical Chemistry, Clinical Microbiology and Immunology, Medical Chemistry, Microbiology, Forensic Medicine, Pathology, Skin and Venereal Diseases, Surgery, Oto-Rhino-Laryngology, Pediatrics, Neurology, Roentgenology, Ophthalmology, Internal Medicine, Obstetrics and Gynaecology, Radiology, Psychiatry.

FACULTY OF TECHNOLOGY

Departments:

Department of Architecture, Department of Mechanical Engineering, Department of Chemical Engineering, Department of Civil Engineering, Department of Electrical Engineering, Department of Technical Physics.

TEACHER TRAINING INSTITUTE

Instruction connected with the training of teachers for comprehensive schools and with further and special training.

In addition, the university has various separate institutes.

UNIVERSITY OF JOENSUU

Tulliportinkatu 1 A,
80100 Joensuu 10

DEPARTMENT OF FINNISH STUDIES
Subjects:
Finnish Language, Finnish Literature, Finnish History.

DEPARTMENT OF MATHEMATICS, PHYSICS AND CHEMISTRY
Subjects:
Mathematics, Physics, Chemistry, Computer Science.

DEPARTMENT OF BIOLOGY AND GEOGRAPHY
Subjects:
Biology, Geography.

DEPARTMENT OF EDUCATION
Subjects:
Education, Psychology

TEACHER TRAINING
Subjects connected with teacher training.

DEPARTMENT OF MODERN LANGUAGES
The first courses will be offered in 1973.

The Carelian Research Institute operates in connection with the college.

UNIVERSITY OF KUOPIO

Puistokatu 20,
70100 Kuopio 10
Subjects:
Medical sciences, science, dentistry.

UNIVERSITY OF TAMPERE

Yliopiston kanslia
Kalevantie 4,
33100 Tampere 10

FACULTY OF SOCIAL SCIENCES

Subjects:
Adult Education, Economics, Library Science and Documentation, Journalism and Mass Communication, Mathematics, Practical Philosophy, Psychology, Social Policy, Social Psychology, Sociology, Mass Communication (separate sections for radio and TV), Statistics, Political Science (General and International separated).

FACULTY OF THE HUMANITIES

Subjects:
English Philology, Philosophy, Phonetics, German Philology, Education, Finnish Literature, Theory of Music; History of Thought, Scandinavian Philology, Public Speaking, French Language, Roman Literature and Latin Language, Finnish History, Finnish Language, Art History, Estonian Literature, General History, General Literature, Dramaturgy.

FACULTY OF ECONOMICS AND ADMINISTRATION

Subjects:
Regional Science, English Language, Public Administration, Public Law, Public Accountancy, International Law, Economics Municipal Policy, Municipal Economy, Tourist Trade, French Language,

Swedish Language, German Language, Social and Economic Ecology, Sociology, Finnish Business Correspondence, Finnish Language, Information Theory, Russian Language, Taxation Law, Private Law, General Business Economics, Business Economics, Marketing, Accounting, Business Administration.

B.S. DEGREE IN ECONOMICS ("EKONOMI")

It is possible to take the Degree of Bachelor of Science (Economics) in the Faculty of Economics and Administration.

MATHEMATICS AND PHILOSOPHY

Subjects:

Philosophy, Mathematics, Economic Mathematics, Computer Science, Statistics.

VOCATIONAL SECTIONS:

SECTION FOR PUBLIC ADMINISTRATION

Subjects:

Administrative Accountancy, Public Law, Economics, Municipal Law, Municipal Policy, Municipal Economy, Municipal Construction Techniques, Turnover Taxation, Criminal Law and Judicial Procedure, Social Policy and Legislation, Finnish Language, Computer Science, Statistics, Tax Law, Organizational Psychology, Office Organization and Documentation, Private and Commercial Law, Accounting in Business.

SOCIAL WORK SECTION

Subjects:

Official Documentation and Office Technique, Out-Patient Care, Welfare Legislation, Institutional Care, Special Education and Consultation in Social Care, Social Medicine and Medical Care, Social Insurance, Insurance, Public Law, Economics, Social Policy.

SECTION FOR SOCIAL STUDIES

Subjects:

Adult Education, English Language, Philosophy, History, Organization Studies, Economics, Education, Library Science, Municipal Policy, Municipal Economy, Latin Language, Mathematics, Methodology in Youth Work, Psychology, French Language, Swedish Language, German Language, Journalism, Alcohol Policy, Social Policy, Sociology, Finnish Language, Oral Expression, Theater Studies, Statistics, Labour Studies, Political Science, Russian Language, Private and Commercial Law.

Moreover, the University has separate institutes, such as the Research Institute and the Drama Studio.

UNIVERSITY OF TURKU

Study Secretaries of the faculties
Yliopistomäki
20500 Turku 50

FACULTY OF THE HUMANITIES

Subjects:
Archaeology, English Philology, Folklore Studies, Phonetics, German Philology, History, Dutch Language, Ethnology, Education, Classical Philology, Finnish Literature, Greek Literature, Latin Language, Theory of Music, Scandinavian Philology, Psychology, Public Speaking, Romance Philology, Roman Literature, Slavonic Philology, Finnish and Comparative Archaeology, Finnish and Comparative Ethnology, Finno-Ugric Linguistics, Finnish History, Finnish Language, Hungarian Language, Theoretical Philosophy, Science of Religion, Comparative Folklore, Estonian Language, General History, General Linguistics, General Literature.

FACULTY OF MATHEMATICS AND SCIENCE

Subjects:
Mathematics, Physics, Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Analytical Chemistry, Botany, Zoology, Geography, Biochemistry, Genetics, Geology & Mineralogy,

Applied Mathematics, Astronomy, Quaternary Geology, Theoretical Physics, Materials Research, Computer Science.

FACULTY OF MEDICINE
Subjects:
Zoology, Physics, Chemistry, Anatomy, Physiology, Medical Chemistry, Clinical Chemistry, Anaesthesiology, Bacteriology & Serology, Pharmacology, Hygiene & Social Medicine, Dermatology & Veneorology, Pulmonary Diseases, Surgery, Oto-Rhino-Laryngology, Pediatrics, Neurology, Forensic Medicine, Pathological Anatomy, Psychiatry, Roentgenology, X-ray Diagnostics, Ophthalmology, Internal Medicine, Gynaecology & Obstetrics, Radiotherapy, Virology, Dental Surgery, Dental Radiology, Dental Prosthetics, Cariology, Orthodontics & Pedodontics, Paradontology.

FACULTY OF LAW
Subjects.
Administrative and Finance Law, Commercial Law, Land Administration, Land Reform and Water Law, Judical Procedure, Criminal Law, Labour Law, Constitutional and International Law, General Jurisprudence, Private Law.

FACULTY OF SOCIAL SCIENCES
Subjects:
Cultural Geography, Education, Practical Philosophy, Political History, Psychology, Social Policy, Sociology, Economics, Statistics, Political Science.

ABO ACADEMY

Kansli
Domkyrkotorget 3
20300 Abo 50

FACULTY OF THE HUMANITIES
Subjects:

World History, History, Cultural History, English Language and Literature, Philosophy, Finnish Language and Literature, Folklore and Local Customs, Phonetics, German Philology, Greek and Roman Literature, History of Philosophical Ideas, History and Theory of Art. Comparative Literature, Music, Scandinavian History, History of Scandinavian Folklore and Culture, Education Psychology, History of Religion, Russian, Swedish Language and Scandinavian Philology, Romance Philology, Latin, Political Science.

FACULTY OF SCIENCE

Subjects:

Biology, Analytical Chemistry, Astronomy, Biochemistry, Botany, Pharmaceutical Chemistry, Pharmaceutical Technology, Pharmacognosy, Pharmacology, Physics, Physical Chemistry, Geology and Mineralogy, Computer Science, Mathematics, Inorganic Chemistry, Organic Chemistry, Statistics, Theoretical Physics.

FACULTY OF SOCIAL SCIENCES

Subjects:

Constitutional and Administrative Law, International Law, Economics, Public Administration, Political History, Philosophy, Private Law, Sociology, Statistics, Political Science, Economic Geography, Business Administration.

FACULTY OF CHEMISTRY AND TECHNOLOGY

Subjects:

Analytical Chemistry, Biochemistry, Electrical Engineering, Physics, Physical Chemistry, Industrial Economics and Economic Law, Engineering, Mathematics, Mechanical Engineering and Study of Materials, Metallurgy, Mineralogy, Economics, Inorganic Chemistry, Organic Chemistry, Process Control, Chemical Engineering, Automated Control, Industrial Chemistry and Chemical Reaction Engineering, Chemistry and Wood Technology, Studies of Heat.

FACULTY OF THEOLOGY
Subjects:
History of Religions, Old Testament Exegesis, New Testament Exegesis, Church History, Systematic Theology, Practical Theology.

HELSINKI UNIVERSITY OF TECHNOLOGY

Opintotoimisto
02150 Otaniemi

DEPARTMENT OF ELECTRICAL ENGINEERING
Electronics
Power Systems Engineering

DEPARTMENT OF TECHNICAL PHYSICS
Technical Physics
Engineering Mathematics

DEPARTMENT OF MECHANICAL ENGINEERING
Mechanical Engineering
Sanitary Engineering
Industrial Economics
Naval Architecture
Aircraft Engineering
Textile Technology

DEPARTMENT OF FOREST PRODUCTS
Mechanical Wood Technology
Chemical Wood Technology

DEPARTMENT OF CHEMISTRY
Chemical Engineering
Biochemistry

DEPARTMENT OF MINING AND METALLURGY
Mining Technology
Metallurgy

DEPARTMENT OF CIVIL ENGINEERING
Construction of Buildings
Water Supply and Construction of Roads & Bridges

DEPARTMENT OF SURVEYING

DEPARTMENT OF ARCHITECTURE
Architecture
Urban Planning

TAMPERE UNIVERSITY OF TECHNOLOGY

Korkeakoulun kanslia
Pyynikintie 2
33230 Tampere 23

DEPARTMENT OF CIVIL ENGINEERING

DEPARTMENT OF ARCHITECTURE

DEPARTMENT OF MECHANICAL ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

LAPPEENRANTA UNIVERSITY OF TECHNOLOGY

Kanslia
Tullitie 1
53100 Lappeenranta 10

DEPARTMENT OF MECHANICAL ENGINEERING

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HELSINKI SCHOOL OF ECONOMICS

Information Officer
Runeberginkatu 14 16
00100 Helsinki 10

DEGREE OF BACHELOR OF SCIENCE (ECONOMICS) ("EKONOMI")

The compulsory and optional subjects to be included in the course of study for the degree of B.Sc. (Econ.) are as follows:

GROUP A. Business Administration (Organization & Administration, Accounting, Marketing, Computer Science), Economics, Law, Economic Geography, Business Mathematics, Product Technology, Statistics.

GROUP B. Philosophy (Logic and Information Theory), Sociology, Applied Psychology, Economic History, Political Science.

GROUP C. FOREIGN LANGUAGES:
English, Spanish, French, German, Russian.

GROUP D. DOMESTIC LANGUAGES:
Finnish Language and Stylistics, Swedish.

SECRETERIAL DIPLOMA ("AKATEEMINEN SIHTEERI")

The compulsory and optional subjects for the Secterial diploma are the same as those for the Degree of B.Sc. (Econ.). In addition, there are courses in typing and shorthand.

DEGREE OF MASTER OF SCIENCE (ECONOMICS) ("KAUPPAT.KAND.")

Subjects for the Degree of M.Sc. (Econ.) can be chosen from the following:

Business Administration (Organization & Administration, Accounting, Marketing, Computer Science), Economics, Law, Economic Geography, Business Mathematics, Product Technology, Statistics, Sociology, Economic History, Political Science, English, Spanish, French, German, Russian, Finnish Language and Stylistics, Swedish.

SWEDISH SCHOOL OF ECONOMICS

Kansli
Arkadiagatan 22
00100 Helsingfors 10

DEGREE OF BACHELOR OF SCIENCE (ECONOMICS) ("DIPLOM-EKONOM")

A. GENERAL SUBJECTS:

Economics, General Business Administration, Auditing, Marketing, Management, Economic Geography, Commercial Law, Political Science, Statistics, Economic History, Computer Science.

B. LANGUAGES:

Swedish, Finnish, English, German, French, Spanish.

DIPLOMA IN CORRESPONDENCE ("DIPLOM-KORRESPONDENT")

Same subjets as for the degree of Bachelor of Science (Economics), additional subjects: stenography and secreterial subjects.

DEGREE OF MASTER OF SCIENCE (ECONOMICS) ("EKONOMIEKANDIDAT")

GENERAL SECTION

A. GENERAL SUBJECTS:

Economics, General Business Administration, Auditing, Marketing, Management, Economic Geography, Commercial Law, Political Science, Economic History, Statistics, Computer Science.

B: LANGUAGES:

Swedish, Finnish, Englsh, German, French, Russian, Spanish.

LANGUAGE SECTION

A. LANGUAGES.

Swedish, Finnish, English, German, French, Russian, Spanish.

B. GENERAL SUBJECTS:
Economics, General Business Economics, Auditing, Marketing, Business Administration, Economic Geography, Commercial Law, Economic Policy, Statistics.

SWEDISH SCHOOL OF ECONOMICS OF ABO ACADEMY

Henriksgatan 7
20500 Abo 50

DEGREE OF BACHELOR OF SCIENCE (ECONOMICS) ("DIPLOM-EKONOM")

General Subjects:
General Business Administration, Business Administration, Marketing, Auditing, Computer Science, Economics, Commercial Law, Economic Geography, Sociology, Statistics, Mathematics, Psychology, Chemistry and Product Technology, Swedish, Finnish, English, German, French, Russian, Spanish.

DIPLOMA IN BUSINESS CORRESPONDENCE ("DIPLOM-KORRESPONDENT")

Subjects same as above + stenography.

DEGREE OF MASTER OF SCIENCE (ECONOMICS) ("EKONOMIEKANDIDAT")

The same subjects are studied as those for the Bachelor's degree.

TURKU SCHOOL OF ECONOMICS

Rehtorinpellontie 3
20500 Turku 50

DEGREE OF BACHELOR OF SCIENCE (ECONOMICS) ("EKONOMI")

Students can choose among the following subjects:

GROUP 1: Business Administration I (Accounting), Business Administration II (Administration and Marketing), Economics, Commercial Law Economic Geography, Economic Sociology, Economic Mathematics, Statistics, Computer Science (EDP).
GROUP 2: English, German, French, Spanish, Russian.
GROUP 3: Finnish Language and Stylistics, Swedish.

DIPLOMA IN BUSINESS CORRESPONDENCE ("KIRJEENVAIHTAJA")

Economic Subjects (Business Administration, International Economics, Commercial Law), Office Technique (General subjects, Stenography, Typing), Finnish Language and Stylistics, French, Swedish, Spanish, English, Russian, German.

DEGREE OF MASTER OF SCIENCE (ECONOMICS)

The same subjects are studied for a Master's degree as for a Bachelor's degree.

VAASA SCHOOL OF ECONOMICS

Raastuvankatu 29
65100 Vaasa 10

DEGREE OF BACHELOR OF SCIENCE (ECONOMICS)

Subjects:
Business Economics (General Business Economics, Administration and Organization, Marketing, Accounting), Economics, Economic Geography, Law, Business Mathematics and Statistics, Computer Science, Economic Sociology, English, German, Swedish, Finnish Language and Stylistics.

DIPLOMA IN BUSINESS CORRESPONDENCE

Same subjects as those for a Bachelor's degree plus Stenography, Typing, and Office Techniques.

DEGREE OF MASTER OF SCIENCE (ECONOMICS)

A minimum of four subjects must be studied for the Master's degree; the subjects are the same as those studied for the Bachelor's degree.

COLLEGE OF VETERINARY MEDICINE

Study Secretary
Hameentie 57
00550 Helsinki 55

DEGREE OF CANDIDATE IN VETERINARY MEDICINE

Subjects:
Zoology, Physics, Chemistry, Anatomy and Embryology, Physiology, Biochemistry.

LICENCE IN VETERINARY MEDICINE

Subjects:
Animal Hygiene, Animal Genetics, Microbiology and Epizootology, Parasitology, Pharmacology and Toxicology, Pathology, Internal Medicine, Surgery, Obstetrics and Gynaecology, Food Hygiene.

2. GOVERNMENT RESEARCH INSTITUTES

National Planning Office
Kaivokatu 6, 00100 Helsinki 10

Economic Planning Centre
Erottajankatu 15–17, 00130 Helsinki 13

Technical Research Centre of Finland
Lönnrotinkatu 37, 00180 Helsinki 18

The Geological Survey of Finland
02150 Otaniemi

Institute of Marine Research
Tähtitorninkatu 2, 00140 Helsinki 14

Agricultural Research Centre
P.O. Box 42
00130 Helsinki 13

The Forest Research Institute of Finland
Unioninkatu 40 A, 00170 Helsinki 17

State Institute of Agricultural Chemistry
Liisankatu 8 G, 00170 Helsinki 17

State Seed Control Office
Maneesikatu 7, 00170 Helsinki 17

Finnish Research Institute of Engineering in Agriculture and Forestry
Rukkila, 00001 Helsinki 1

State Control Office for Dairy Products
Töölönkatu 26 b, 00260 Helsinki 26

Finnish Game and Fisheries Research Institute
Unioninkatu 45, 00170 Helsinki 17

Agricultural Economic Research Institute
Rukkila, 00001 Helsinki 1

State Veterinary Institute
Hämeentie 57, 00550 Helsinki 55

Finnish Geodetic Institute
Hämeentie 31, 00500 Helsinki 50

Finnish Meteorological Institute
Vuorikatu 24, 00100 Helsinki 10

Central Public Health Laboratory
Mannerheimintie 166, 00280 Helsinki 28

Institute of Radiation Physics
Pohj. Esplanaadinkatu 31 A, 00100 Helsinki 10

Institute of Criminology
Pengerkatu 30 D 32, 00500 Helsinki 50

Central Statistical Office of Finland
Annankatu 44, 00100 Helsinki 10

General Office of National Antiquities
Mannerheimintie 34, 00100 Helsinki 10

State Archives
Rauhankatu 17, 00170 Helsinki 17

Tampere Peace and Conflict Research Institute
Tammelanpuistokatu 58 B, 33100 Tampere 10

Institute of Modern Finnish
Hallituskatu 1, 00170 Helsinki 17

Research and Development Centre of the Defence Forces
34110 Lakiala